A FRAMEWORK FOR THE INTEGRATION OF MANAGEMENT SYSTEMS IN ORGANISATIONS

by

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DECLARATION

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A FRAMEWORK FOR THE INTEGRATION OF MANAGEMENT SYSTEMS IN ORGANISATIONS

I declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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SIGNATURE **DATE**

DEDICATION

This study is dedicated to my late father, Moonsamy (Victor) Naidoo.

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I am primarily grateful to God and the spiritual guidance of Sri Sathya Baba, for giving me the ability and opportunity to start and complete this research.

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ABSTRACT

During the last decade, the integration of management systems (this includes any management system that is used to achieve the goals of an organisation example PASCAL, ISO standards and enterprise resource planning), has become an increasingly important strategy adopted by organisations, as it represents an alternative to operating with multiple management systems in parallel (Abad, Cabrera & Medina, 2014:860). Despite the established need for the integration of management systems, research on how to carry out integration has yet to be developed fully and an elaborated methodology of integration needs full realisation (Bernardo, Casadesús, Karapetrovic & Heras, 2012; Rocha, Searcy, Karapetrovic, 2007; Wilkinson & Dale, 1999a; Zeng, Shi & Lou, 2007).

The aim of the current study was to develop a framework for organisations that could be used for the integration of management systems in a structured manner. This study was undertaken by exploring the views and opinions of senior management through fourteen face-to-face semi-structured interviews. Thereafter, an online survey collected 220 responses from four South African multinational organisations involved with management system development and implementation. The research instrument used a seven-point Likert-type scale for the respondents to rate each question. The data was analysed statistically primarily using factor analysis to confirm the significant factors and then structural equation modelling to test the relationships between the factors, which ultimately confirmed the developed framework.

The beneficiaries of this research are primarily organisations that have three or more management systems in an organisation. The framework will also be valuable to management in industry and policymakers since it addresses key integration issues, such as employee performance, organisational culture, employee motivation and policy as factors when considering integration of management systems.

Keywords: integration, management, systems, employee performance, standards, innovation, factor analysis, structural equation modelling, framework, policymakers, policy, organisational culture, employee motivation

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LIST OF ACRONYMS AND ABBREVIATIONS

ASME	American Society for Mechanical Engineering
BIPM	Business Informatics Performance Model
CEO	Chief Executive Officer
CIO	Chief Information Officer
CQIPs	Continuous Quality Improvement Programmes
CR	Critical Ratio
DS	Danish Standards
HILO	High Integrated Level Organisation
ICT	Information and Communication Technology
IMS	Integrated Management System
LILO	Low Integration Level Organisation
M&A	Merger and Acquisition
MNE	Aulti-National Enterprise
MS	Management System
MSE	Small Medium-Sized Enterprise
MSS	Management System Standard
NGO	Non-Governmental Organisation
PAS	Publicly Available Standard
SDO	Service Development Organisation
SEM	Structural Equation Modelling
SLA	Service Level Agreement
SPMS	Strategic Performance Management System
SPSS	Statistical Package for Social and Science
TCN	Third Country National
TQM	Total Quality Management
TSp	Technical Specification
TSs	Technical Standard

CHAPTER 1

CONTEXTUALISING THE RESEARCH

1.1 INTRODUCTION

The purpose of this chapter is to provide an orientation to the thesis and the background to the study, an overview of the research problem, the research question, the aim and objectives, a brief overview of the methodology and the significance and effect of the study.

1.2 BACKGROUND TO THE STUDY

A system such as ISO 9001, ISO 14001 and the PASCAL accounting system is a chain of interconnected components, processes or actions that produce strategic results. These systems can be put together to work in harmony forming new systems. This putting together can be done by integration or combination. When we speak about integration, it means to bring parts of a system that are interwoven together to form a complete whole that cannot be separated (Bernardo, 2014). A similar concept is combination, which brings different systems together but which can be separated (Parnell & Hershey, 2005).

However, many organisations do not realise the benefits of integrating management systems, as they presently appear as a paper-based exercise. For example, ISO 9001, ISO 14001 and Occupational Health and Safety Assessment Series (OHSAS) are said to be integrated as Safety, Health, Environment and Quality (SHEQ) system but in effect, it is three systems working in parallel (Bernardo, 2014; Santos, Mendes & Barbosa, 2011). This means that they are combined to a certain extent but not totally integrated. In other words, there is the intention of integration but the result is not integration.

With the increase of the use of ISO systems, an increase of 3% per year (ISO, 2015), and the need for organisations to reduce operating expenses, it is important to integrate more systems effectively and efficiently to avoid additional overheads.

1.3 RESEARCH PROBLEM

An integrated management system (IMS) is not being used as a tool to improve organisational efficiency (according to Carvalho, Picchi, Camarini and Chamon, 2015 is the need to consider the processes in terms of added value, obtaining results in performance and of the process, and

continuous improvement of the processes based on objective measurements) and this can partly be attributed to why South Africa is experiencing its highest unemployment rate of 27.7% since 2007 (StatsSA, 2017). Organisations are working with management systems in a silo, where these systems are operating in parallel with other management systems which inhibits the main (operational and financial) drivers (Garcés-Mascareñas & Penninx, 2016; Rebelo et al. 2014; Dordević et al. 2010) of an IMS. Therefore, the problem statement for this study was stated as:

> **There is a poor understanding of an IMS and organisations need a better tool to integrate management systems.**

1.4 RESEARCH QUESTION

The research question for this research was:

> **What would be a suitable framework that could be used to integrate management systems in a structured manner towards improving efficiency in an organisation?**

Sub-questions to be addressed in the research comprised the following,

- What are the factors that should be considered for the development of a framework for the integration of management systems?
- What is the relationship between the factors when integrating management systems?

1.5 RESEARCH AIM

The aim of this research was to develop a framework that can be used by organisations for integration of management systems in a structured manner.

1.6 RESEARCH OBJECTIVES

Objective 1 – to identify a set of factors from the related literature that could be applied to develop the framework.

Objective 2 – to identify an appropriate research methodology to investigate the relationship and validity of these factors**.**

Objective 3 – to formulate the framework statistically using the data from objective 2.

1.7 RESEARCH SCOPE

The research was mainly conducted within the Information and Communications Technology (ICT) organisations which were involved in developing and implementing integrated systems. This knowledge was then translated into management systems.

1.8 METHODOLOGY

The next section briefly explains the research approach.

1.8.1 Research approach

The research paradigm that was followed was first qualitative with semi-structured face-to-face interviews to test the conceptual framework derived from the literature review. Then quantitative analysis was conducted to validate the most significant factors of the research that emerged through statistical factor analysis. Thereafter, structural equation modelling (SEM) was used to test the hypothesis on the relationship between the factors. The research methodology is discussed in greater detail in Chapter 4.

1.9 VALIDITY AND RELIABILITY

The research validity and reliability are discussed extensively in Chapter 4.

1.10 RESEARCH ETHICS

The research was conducted by following the Unisa ethics policy, which required an ethics certificate before data collection could be started. After approval from Unisa, School of Business Leadership was received with ethics number, 2016_SBL/DBL_033_FA, the research commenced. Please see Appendix 4 for approval letter.

1.11 SIGNIFICANCE AND OUTCOME OF THE RESEARCH

This framework from the study will assist organisations to integrate management systems in a structured manner to achieve efficiency and effectiveness. This should assist in the objectives of reducing the operating costs of the organisation. More specifically, the following organisations could benefit:

- organisations that are currently using existing multiple management systems in parallel;

- organisations that have management systems and want to commence this journey; and
- national bodies, such as the South African Bureau of Standards (SABS), will find the framework informative and may be used to develop an integrated standard.

1.12 STRUCTURE OF THE THESIS

This section presents the layout of the thesis.

1.12.1 Chapter 1: Contextualising the research

The objective of Chapter 1 is to contextualise the research by providing an appropriate introduction and defining the background. The research problem, aims and objectives of the research are also described.

1.12.2 Chapter 2: Literature review on integration

This chapter discusses the theoretical aspects related to the research. One of the intentions the literature review was to present the different aspects of integration that support the research so that the research instrument (questionnaire) could be compiled.

1.12.3 Chapter 3: Review of the literature on standardisation and combination

This chapter presents a discussion of the theoretical aspects related to standardisation and combination as two important processes during integration. One of the intentions for standardisation and combination literature was to present the different aspects that support the research so that the research instrument (questionnaire) could be compiled. The conceptual framework is presented.

1.12.4 Chapter 4: Research design and methodology

The chapter provided an opportunity to present the structure of the research methodology. It also reflects a justification of the chosen research design and approach by referring to literature from prominent research methodology authors.

1.12.5 Chapter 5: Data analysis and discussion of the research results

The chapter presents the data analysis and a discussion of the research results of integration of management systems. The statistical approach used is reported here and aligned to the

research methodology in Chapter 3. An interpretation of the data is also presented together with the developed framework.

1.12.6 Chapter 6: Findings, conclusions and recommendations

The chapter presents the findings, a discussion of each research objective and how they were achieved. The conclusions and recommendations of the research are also presented.

1.13 CHAPTER SUMMARY

The chapter introduced the topic and positioned the issues that the research intended to study. The problem statement was discussed. The objectives have been developed, providing the platform for an extensive literature review to be undertaken. This is reported in Chapters 2 and 3.

CHAPTER 2

LITERATURE REVIEW

Bryman (2012) declares that using existing literature on a topic is an approach to develop an argument about the significance of your research and where it leads. In order to research the IMS, the following are presented: an introduction to integration theory, the various integration approaches and the evolution of integration as a process. Furthermore, the research aimed to provide a plenary review of literature in the field of integration and take stock of its integration achievements and challenges to date. This chapter is divided into 17 sections.

2.1 INTRODUCTION

The globalisation process during recent decades has led to the strong internationalisation of the world economy. This has intensified competition and forced organisations to search for new ways to succeed in markets that are globalising and converging. Most integration theories have been advanced within the background of Western academics and although their pedigrees differ, and subsequently their ontological and epistemological foundations, European integrationists share quite a lot of common ground with Western academics (Wiener & Diez, 2009). In other words, many theorists make broad claims such as 'explaining integration', when what they really do is much more limited to organisations, for instance explaining results of intergovernmental conferences, criticising a particular conceptualisation of integration, or seeking to understand the historical development of a particular aspect of integration. This problem, as well as the criticism of it, is not new.

In the last decade, the number of management systems (MSs) and standards has increased considerably. The purpose of these MSs is to facilitate organisations to address various stakeholder requirements systematically. The International Organisation for Standardisation (ISO) has developed standards for some of the MSs, such as quality, environment, customer satisfaction, and auditing, among others. Research has shown that maximum benefits from (standardised) MSs are obtained when they are integrated into one holistic MS (Jorgensen, Remmen & Mellado, 2006). Furthermore, Maryska and Sladek (2017) accentuate that the management of an organisation is responsible to stakeholders and is also responsible for all activities and actions that are realised in the organisation. According to stakeholder theory (Freeman & Reed, 1983), organisations must take into account the interests and expectations of their various stakeholders, defined as ''any identifiable group or individual who can affect

the achievement of an organisation's objectives, or who is affected by the achievement of an organisation's objectives''. Furthermore, because complexity is concerned with pattern formation, procedures for example remain stable for as long as the system maintains itself as viable within the larger medium or domain, which it helps to sustain through interactions with other systems that are also self-produced, yet adaptive within the larger medium (Horn & Wilburn, 2005). Thus, the research of complexity is bounded by the capacity of self-sustaining systems to interact and adapt autonomously within the self-defining boundaries that sustain the agent intra-actions and inter-actions. Organisations are complex systems, and management is not only accountable to their shareholders; they must also take into account the needs of various groups or individuals who have direct or indirect relationships and stakes in their activities: employees, customers, government agencies, non-governmental organisations (NGOs), suppliers and the media. As the number of MSSs versus standardised MSs increases, their integration becomes a necessity (Bernardo, Casadesús, Karapetrovic & Heras, 2012).

Eminent scholars (such as Anderson, 1981; Blau, 1960) have contributed significantly to the development of information theory and social theory respectively. Reflecting on the development, achievements and problems of approaches (ontological and epistemological form) to integration, the presentation of complexity and systems theory will allow for comparing and relating individual approaches to each other.

2.2 SYSTEMS THEORY AND COMPLEXITY THEORY

In recent years, systems thinking approaches and the application of complexity theory to evaluation seemed to have gained momentum, if judged by the publication of books and journal articles. These approaches are appealing because they are non-partisan. A complex system is defined by relationships rather than by its constituent parts (Walton, 2016). Sub-systems and individual components typically have functions or goals, but given the complexity of relationships between components, it is impossible to characterise the system on the whole as having a unified purpose (Manson, 2001). Therefore, this approach opens a unique path toward bridging and integrating conflicting factors regarding an IMS, as identified in the conceptual framework of an IMS.

2.2.1 A review of complexity theory

With the lens of complexity, we are able to see whole systems as irreducible examples of knowledge in action, thus establishing a clear link between behaving and thinking, or between "data of sense and data of consciousness" (Lonergan, 1958:21). Complexity theory is not a

unified body of theory; it is an emerging approach or framework. It is a set of theoretical and conceptual tools; not a single theory to be adopted holistically. Complexity theory contains several different approaches, substantive foci, and theoretical priorities (Thrift, 1999). Furthermore, Horn (2008) argues that complexity theory introduces an orientation that allows consideration of social systems in terms of both the information and communication exchanges that make social systems distinct from their biological foundations.

Complexity focuses on emergent behaviours that result from interactions within and among self-organising and adaptive systems (Barlow & Waldrop, 1994; Richardson, 2005). The goal of the complexity sciences is to comprehend and explain general laws of pattern formation (Barlow & Waldrop, 1994), which signify transitions within autonomous, open systems.

Gummesson (2008:16) indicates that complexity theory (see Manson, 2001) is recognising that numerous variables interact, that the number of unique situation is unlimited, that change is a natural state of affairs, and that processes are iterative rather than linear.

The rise of complexity in the social sciences can be viewed as linked to concerns over globalisation, particularly bipolar stability in the wake of the end of the Cold War (Singer, 1971). Complexity copes with the difficulty of incorporating structure and transformation, stability and change, and the interactions of multiple actors operating at a variety of systemic levels, through the concepts of emergence and a complex adaptive system. In general systems theory, a system is commonly seen as “no more than the sum of its parts” (Singer, 1971:19) and the patterns of interactions and relationships among them.

As an example, in research by Walton (2016), 41 key informant interviews were conducted on expert views on applying complexity theory and evaluation. Participants interviewed included public sector evaluation and policy professionals (14), private evaluation consultants (10), academics with experience in evaluation and policy research (16), and one manager of an NGO. The majority of participants were located in New Zealand (26), with the remainder located in Australia (4), the United Kingdom (8), Canada (1) and the United States (2). It was found that participants described complexity in two broad ways:

- complexity of interventions; and
- complexity of social systems within which interventions are delivered.

These categories are not mutually exclusive, with some participants noting that these two types of complexity interacted. Complexity of social systems, for example, encourages complexity of interventions. Participants who focused on complexity of interventions were often evaluation practitioners, and they focused on application of systems methods to evaluation. Those

participants who focused on the complexity of social systems were likely to be engaged with complexity and systems approaches wider than the evaluation field and in policy, politics, and health and social service fields.

2.2.2 An overview of the challenges of complexity theory

Walton (2016) found that a barrier to complexity implementation was the neglect of the normative element. It was seen that, while complexity informed methods, mostly of a modelling nature, may focus on interactions and dynamics between actors within a system, methods often overlook power within these dynamics. To counter a lack of power analysis, Walton (2016) found that several participants emphasised the use of participatory methods, critical systems approaches and dialogical processes alongside modelling or quantitative methods. Complex system concerns, such as initial conditions and tipping points, may well apply when evaluating even simple interventions, and it is the process of defining boundaries of the evaluation that will at least partially determine whether an intervention is viewed as simple, complicated or complex (Walton, 2016). For example, while a vaccination may be a simple intervention, effectively delivering the vaccination to a population requires a host of local negotiations within organisational and cultural systems, which themselves could be considered complex systems

The attempt to theorise multiple inequalities simultaneously without a necessarily hierarchical and nested relationship between them puts pressure on the old conceptualisation of a system which is stretched to breaking point.

2.2.3 A review of systems theory

The systems theories of Russel Ackoff (1999a) are based on an analysis of the concept of systems and on system thinking. This theory is preferred because the IMS is a system of systems. The main aim of this thesis is to understand how the elements constituting the system best can interact to produce the expected outcomes. Ackoff defines a system as a set of elements that satisfy the following (Ackoff, 1999a):

- The way each element behaves has an effect on the performance of the whole. As an example, the way different management systems are integrated in a safety management system, quality management system and environmental management system, each has an effect on the other.
- The behaviours of the parts and their synergies holistically are interdependent. This means that the way one factor behaves, affects the entity and the manner it affects the entity depends at least on how another factor behaves.

- However, subgroups of the elements are formed and each has an effect on the behaviour of the whole and none has an independent effect on it. That is to say the elements that make up the system are so interconnected that it is not possible to form independent subgroups of them. In an integrated management system, it is not possible to separate the subgroups because one person might be doing the work pertaining to two or more systems. However, it is possible to identify the different management systems especially for the purpose of auditing.

2.2.4 A summary of the theories presented

Therefore, it is important that the different management systems interact well and the success of an IMS cannot be determined by a single measure, but by several measures. Complexity theory emphasises the importance of non-linear changes: small events can lead to large-scale changes in systems, for example, precipitating the bifurcation of paths of development. Within the natural sciences, the example often cited is that of a small disturbance to the atmosphere in one location, perhaps as small as the flapping of a butterfly's wings, tipping the balance of other systems, leading ultimately to a storm on the other side of the globe (Capra, 1997).

The systems theory gives a description of how a system functions and the best ways of interactions within the systems to produce the best results. There are two key principles in this theory (Lee, Shiba & Wood, 1999).

- One important factor leading to success in a system may not depend on whether each element performs its function, but on whether the elements interact well. Therefore, the success of an IMS does not necessarily depend on the success of other management systems, but on whether these management systems are well combined in the IMS.
- Secondly, any single measure of success is misleading, and it is only possible to understand and track the success of a system by following a carefully chosen collection of measures.

Complexity theory challenges further aspects of systems theory, especially those forms associated with Durkheim (1966). The notion that equilibrium was the norm to which a system would return if there was a small deviation, via the mechanism of a negative feedback loop, is challenged by the discovery of positive feedback loops that drive a system forward beyond equilibrium (Arthur, 1994; David, 1985). Thus, the research of complexity is bounded by the capacity of self-sustaining systems to interact and adapt autonomously within the self-defining boundaries that sustain the agent intra-actions and inter-actions. This may directly imply that if elements are put together to form a system, then they gain some essential properties.

However, an important issue to consider here is the interaction between these elements. As complexity is concerned with pattern formation, the focus of this research is on transformations that provide organisations for growth, change and learning (Horn & Wilburn, 2005). These boundaries or parameters remain stable for as long as the system maintains itself. Therefore, the current research was positioned around the theory of complexity which looks at the factors at the different levels of an organisation and their inter-relationships with one another.

2.3 INTEGRATION WORLDVIEWS

In this section, the researcher provides an extensive review of seminal integration worldviews as an important contribution to the evolution of integration theory.

2.3.1 A presentation of the philosophy of integration

Lindberg (1963) refers to Ernst Haas, who is one of the most influential neo-functionalist integration theorists. Haas once defined integration as the process “whereby political actors in several, distinct national settings are persuaded to shift their loyalties, expectations and political activities toward a new centre, whose institutions possess or demand jurisdiction over the pre-existing national states” (Haas, 1975). Haas proposes two aspects in his definition. First, Haas refers to social aspects when he discusses loyalties that need to be shifted and then he refers to the political aspect of the development of new political institutions.

Inter-governmentalists have proposed a definition that is coming from a different approach within the range of integration theory. This definition focuses more narrowly on the creation of political institutions to which member states subscribe. Therefore, Haas's definition includes approaches that deal at least with the political integration process, while some of them (for example Anderson, 1971) goes beyond this proposal and addresses social integration as well. The presentation of the definitions indicates that integration is now more of a process as both the neofunctionalists and inter-governmentalists are more concerned with the process of integration than with the political system to which that integration leads.

The varying schools of thought, and various scholars have explained the altered chunks of the integration animal. The researchers explain that their parts are in fact part of the animal or that their parts are the most important ones, the others being of marginal interest. Interestingly, it is the academic context where national differences seem to matter most, rather than the socio-political context. Furthermore, it is interesting to note that classic integration theories have been developed and advanced in the United States instead of in Europe (Haas, 1975).

Furthermore, Haas and inter-governmentalists understand integration as an outcome rather than the process that it needs to be. However, their work needs to be included in our understanding of integration as it undeniably now forms an important component in the field of integration that needs to be better understood. Wiener and Diez (2009) suggest that the development of integration theory can be divided into three broad phases. These are preceded by a normative proto-integration theory period. The three phases are respectively explanatory, analytical, and constructive**.**

Table 2.1: The three phases of integration theory

Phase	When	Main themes	Main theoretical reference points
Explaining integration	1960s onwards	• What are the consequences of integration? • Why would integration in Europe take place?	Liberalism, realism, neoliberalism
Analysing governance	1980s onwards	• Try to understand the type of political system in Europe.	Governance, comparative
		• Try to describe the political process in the EU. • Explanation of the EU regulatory process.	Political and policy analysis
Constructing the EU	1990s onwards	• The type of social and political outcomes that develop through integration.	Social constructivism, post-structuralism, international political economy
		• How are integration and governance conceptualised? • How should they be?	Normative political theory and gender approaches

Source: Wiener and Diez (2009)

There needs to be caution regarding Table 2.1, however, considering that most strategies integrate various dimensions of the theory. To divide the respective phases as presented may not be as clear-cut as suggested. The phases are therefore meant to identify the emergence, development, and, at times, dominance of particular theoretical tendencies, but do not suggest that these were the only (and sometimes not even the dominant) ones.

2.3.2 European economic integration process as the departing point for integration

Peters-Berries (2010) accentuates that the European Union (EU) follows two main ways of making judgments. It can issue an instruction, which creates a shared purpose for all participating states, but allows the national authorities to decide on the implementation

process. Secondly, it can issue a regulation, which must be immediately implemented throughout the EU.

Furthermore, Peters-Berries (2010) posits that the European integration process has many accomplishments which can be summarised as follows.

- A free trade agreement with the EU through the establishment of a customs union.
- No restrictions on people traveling in 15 countries. People can decide where they want to work, and where they want to travel. This is without any restrictions on borders of entry.
- European citizenship allows citizens to have a common passport.
- The currency is standardised through the euro, which was completed in 2002.
- The integration of laws and regulations regarding economic, environmental, health, social and transport issues.
- The transfers of parts of national sovereignty to supranational EU institutions.

It can be deduced that European voices are advocating a form of social inquiry which is different from the American social science model, which is more normative and theory driven.

2.3.3 A presentation of Blau's structural theoretical models of integration

Blau (1960) proposes the following types of models of integration:

Egalitarian model: This is integration of values in the sense often found in international relations theory: actors are seen as having 'coinciding interests'. In general, the actors are joined together in a way that both actors have equal value, as opposed to the term conflict coupling which indicates that a higher value for one actor not necessarily means a higher value for the other actor as well.

Hierarchical model: This is 'integration of values' of the different actors involved. This discipline is most frequently found in psychology and sociology, and perhaps particularly often in social psychology. This model explains that the values of the values are arranged in a hierarchy so that dilemmas can be solved by picking the value highest in the hierarchy.

Similarity model: Here integration is seen as a process of increasing similarity between actors. There are many kinds of similarity: similarity of rank, similarity in demographic composition, in economic structure or in political structure. The last cases are usually referred to as homology, a similarity in structure so that each member or one actor can find his or her 'opposite number' in the other actor. Another aspect of homology, or perhaps of cultural

similarity, would be harmonisation of laws and regulations. In the literature on the East–West conflict, this is usually known as the 'convergence thesis' (see Levitt, 1983), with the implicit assumption that the higher the similarity, the more peaceful the relationship.

Interdependence model: Integration is here seen as a process of increasing interdependence between actors. Interdependence can be cultural, political, and economic, but the latter is probably the one most usually thought of in this connection. Interdependence is often referred to as 'symbiosis', i.e. the symbiotic process is whereby both actors are equally effected either positively (benefit) or negatively (challenge).

Loyalty model: This model can be explained whereby each actor contributes equally to ensure the supported parts make up the whole. This is normally undertaken through commitment and dedication from member states to ensure the process is well supported, normally by allocating resources.

Allocation model: This model presents that the allocation model can only function effectively if it can make a reasonable contribution to the component parts. This offer may be seen as an output from the whole to the parts, as when a nation provides individuals with identity, protection and a sense of purpose, and the regional or universal organisation serves as a multilateral marketplace for persons, goods/capital, services or information, effectively redistributing these resources where they can best be put to use. But the point here is that all six constitute conditions of integration, and probably also conditions that are neither necessary, nor sufficient for integration to take place. Hence, against this background the search for a definition that can be used at all levels, regardless of conditions and consequences.

The models expressed by Blau (1960) identify the different social structures and their people to depend on each other to gain trust, loyalty and maintain relationships in organisations. This is seen as critical juncture for the integration process where different levels of an organisation or nation states align their systems so that it is not just a social system, but a process that is active and alive.

2.3.4 The three dimensions of social integration

Entzinger (2000) indicates that the basic definition of integration includes three, methodical, clear dimensions in which people may (or may not) become an accepted part of society: the legal-political, the socio-economic, and the cultural-religious. These dimensions correspond to the three main factors that interplay with immigration and integration processes: the state, the market, and the nation. Figure 2.1 provides an overview of the social integration process.

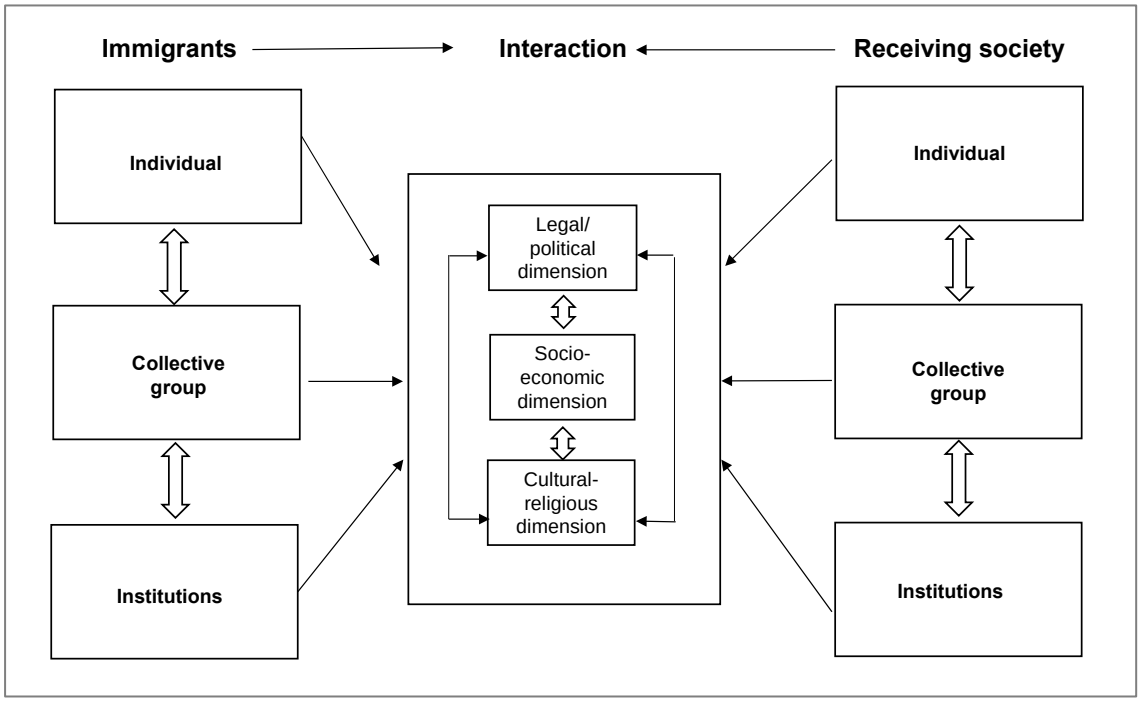

Figure 2.1: Heuristic model for the empirical research of integration processes

Source: Entzinger (2000)

It must be noted that the three dimensions that are presented are not fully independent of one another. The legal-political dimension may condition the socio-economic and the cultural-religious dimensions, as represented by arrows in Figure. 2.1.

- The legal-political dimension refers to residence and political rights and statuses. The fundamental question that must be answered is at what stage do we determine whether immigrants are fully fledged members of the political community. The position of an immigrant or the degree of integration has two extreme poles.
  - One of these is the position of the irregular immigrant who is not part of the host society in the legal-political sense, though perhaps being integrated in the other two dimensions.
  - The other is the position of the immigrant who is (or has become) a national citizen. In between there is enormous variety, which has increased in recent decades as a consequence of attempts of European states to regulate international migration and the new statuses and rights stemming from the EU migration regime (among others, EU nationals versus third-country nationals or TCNs).
- The socio-economic dimension refers to the social and economic position of residents, irrespective of their national citizenship.

At this point, immigrants can audit their access to and inclusion in territories that are important to a resident. One question is whether immigrants have the same access to institutional facilities as normal residents do? Can they find work, housing and health care easily?

What is the outcome of immigrants' participation compared to that of natives with the same or comparable qualifications? Since needs and aspirations in these domains are relatively universal (basic needs are largely independent of cultural factors), access to and participation of immigrants and natives in these areas can be measured comparatively. The outcomes, particularly when they are unequal, provide useful inputs for policies.

- The cultural-religious dimension pertains to the domain of perceptions and practices of immigrants and the receiving society, as well as their reciprocal reactions to difference and diversity. If newcomers see themselves as different and are perceived by the receiving society as culturally or religiously different, they may aspire to acquire a recognised place in these respects. For their part, the receiving society may or may not accept cultural or religious diversity. Here again we find two extremes.
    - At one extreme, new diversity may be rejected and immigrants required to adapt and assimilate into mono-cultural and mono-religious societies.
    - At the other extreme, ethnic identities, cultures, and worldviews may be accepted on an equal level in pluralistic societal systems.

Between these two extremes again are many in-between positions, such as accepting certain forms of diversity in the private realm but not, or only partly, in the public realm.

This third dimension, and the specific positions of immigrants and immigrant groups, is more difficult to measure, basically for two reasons.

- First, it is less about objective differences and diversity (ethnic, cultural, and religious) than about perceptions and reciprocal normative evaluations of what is defined as different and the consequences of such categorisations. Categorisations may become stereotypes, prejudices, and ultimately part of immutable racist ideologies. Moreover, the basis of categorisations may change. For example, in the guest worker period (1960-1975), the fact that an increasing share of immigrant workers were Muslims was not seen as relevant. It was only from the 1990s onwards that such migrants and their families were categorised as coming from Muslim countries.
- Secondly, categorisations and reciprocal perceptions manifest differently at different levels (i.e. at the individual, collective, and institutional levels), and their consequences may also differ. If contacts between individuals are coloured by prejudice, interactions

may be uncomfortable, but may have a limited effect. Yet, at the institutional level, if employers base their recruitment of workers on stereotyped or prejudiced perceptions and procedures, the consequences for individual immigrants may be quite negative.

To summarise Blau (1960) posited that integration must take into consideration different actors and how they integrated into the process as critical, whereas Etzinger (2000) defines integration as a process or a series of interactions that people or immigrants go through in a host country, which gives them access to legal and political rights.

Therefore, integration of people into host countries must establish the social and legal integration policies of host countries before embarking on this journey. Additionally, organisations must ensure that integration is undertaken in a structured manner to incorporate all stakeholders.

2.3.5 Summary of the worldviews

To summarise, analysing integration is not only a practical matter, but involves important and particular considerations and conceptualisations of integration. Reviewing the history of European integration validates that there are numerous incidents that are hotly debated in the integration literature, mostly due to analysts approaching them from different theoretical angles.

2.4 THE MOSAIC OF THEORETICAL APPROACHES TO INTEGRATION

There are multiple, overlapping sources in literature in which ostensibly relevant notions of integration arise which are discussed in this section. Even if this is the case, however, any two approaches may still not be directly testable against each other. The example of liberal inter-governmentalism (which focuses on the creation of political institutions to which member states subscribe) versus neofunctionalism (a social process, the shifting of loyalties and a governmental process, the construction of new political institutions), illustrates this case. While both approaches want to explain the political process of reaching a decision, and to some extent the outcome of that process in terms of its effects on the polity, they analyse different aspects of the decision-making process, because they start from a different definition of integration.

2.4.1 Ontological and epistemological approaches to integration

Ontological approaches often unambiguously or tacitly claim to provide a theoretical approach to (European) integration, while they in fact focus on a particular process or outcome. If this

claim is relaxed, it should be possible to combine different approaches depending on the subject of analysis. Epistemological approaches would only be incommensurable if they claimed to have the same purpose and if they were directly related to reality (Wiener & Diez, 2009). This implies that these approaches agree on the aim of explaining integration. However, they are not always direct competitors either, although some of them will indeed formulate hypotheses that can be tested against each other. Instead, one might see them as a puzzle in an always-incomplete mosaic.

2.4.2 The approach of Norman Anderson's information integration theory

According to Anderson's information integration theory, which is applied to attitudes and social judgments, it considers the ideas in a persuasive message to be pieces of information, and each relevant piece of information has two qualities: value and weight. The value of a bit of information is its evaluation (favourable or unfavourable) and the weight is the information's perceived importance.

In the example presented by Anderson (1971), Steve tells Sarah that Joe has a ponytail. The value of this information is whether Sarah thinks a ponytail (for Joe) is good (attractive) or bad (unattractive or inappropriate). The weight is how much that friend's hair style matters to Sarah. If it does matter (has some weight) and if Sarah thinks it is good for Joe to wear a ponytail, then this piece of information inclines Sarah to have a favourable attitude toward this friend. Both factors influence our attitudes. Information that is high in value, highly favourable (or highly unfavourable), and high in weight (is very important to us) will have more influence on our attitudes than information low in value or weight. Information with low value (slightly favourable or slightly unfavourable) and low weight will have the least influence on our attitudes.

Therefore, information integration theory suggests that new information is integrated with existing information to create a new attitude. Furthermore, judgments about fairness and equity typically require integration of several pieces of information. Fair division of a reward, for example, requires an integration of each person's work contribution and other possibly relevant factors such as effort and need.

2.4.3 Policy as an approach for IMS

Garcés-Mascareñas and Penninx (2016) indicate that there have been several developments in integration studies that have significant influence to improve the understanding of the role of policy in the receiving society of immigrants' integration.

2.4.3.1 The influence of policy on integration

Candel and Biesbroek (2016) state that many of today's most pressing societal challenges including terrorism, food security, climate change, involuntary migration, or underemployment are cutting across the boundaries of established jurisdictions, governance levels, and policy domains. While it is recognised that these problems require some level of policy integration, severe integration challenges to policymakers and their institutional surroundings continue to exist. These integration challenges emerge particularly when complex societal issues are confronted with traditional forms of subsystem policymaking within hierarchic governance systems.

Candel and Biesbroek (2016) identify four dimensions that constitute policy integration:

- Policy frame: the policy frame here entails the problem definition and governance understanding that is dominant among the governance system's macro-political venues and decision-makers. This dominant problem definition may deviate from whether and how the problem is perceived in individual policy subsystems. The absence of a policy frame that fosters a common governance approach can pose serious risks.
- Subsystem involvement: this dimension captures the range of actors and institutions involved in the governance of a particular cross-cutting policy problem.
- Policy goals: each governance system and associated subsystems have several short-, medium-, and long-term policy goals to pursue, some of which are directly affecting or are affected by the cross-cutting problem. A policy goal here refers to the explicit adoption of a specific concern within the policies and strategies of a governance system, including its subsystems, with the aim of addressing the concern. We recognise that policies can be rather abstract and set out strategic lines.
- Policy instruments: The fourth dimension of policy integration consists of the substantive and/or procedural policy instruments within a governance system and associated subsystems. Substantive instruments allocate governing resources of authority, treasure and organisation.

In addition, Garcés-Mascareñas and Penninx (2016) found in their research that policy matters, not only policy at the national level, but also that at the regional and local levels. Indeed, these might differ considerably from one another, and stem from very different and even opposed policy rationales, such as priorities of immigration control and sovereignty at the national level versus the preservation of social cohesion at the local level. Furthermore, the shift in focus from government to governance, from policy to policymaking, allows us to

conclude that what matters is not only policy frames and policy measures (i.e. policies as written on the books) but also how these policies are organised and implemented by the different actors involved, i.e. policies in practice. As an example, the City of Philadelphia Mayor's Office in 2008 implemented their policy stating that ensuring immigrant integration is also an important issue for the city government to develop strategies and policy recommendations for improving the integration of immigrants and language and cultural minorities into the social and economic fabric of the city.

Eastmond (2011) argues that policies often posit ideal outcomes and their vague formulations are not always clear guides for action to those who are to implement them. The example presented was an example that Bosnians in Norway and Sweden enjoyed a better standard of living than in Rome. In Rome, by contrast, there had been virtually no state policy of integration in place, assistance was limited, and the initial years of settlement had been a struggle.

Therefore, as a result, it can be summarised that how policy is translated into local-level (organisational) practice, seems to be a crucial question for understanding whether integration programmes achieve their goals. The research of policies is fundamentally different from the research of integration processes. The essence of policies is the intention to guide and steer processes in society. Explicit integration policies are part of a normative political process in which the issue of integration is formulated as a problem, the problem is given a normative framing, and concrete policy measures are designed and implemented to achieve a desired outcome (Garcés-Mascareñas & Penninx, 2016). The desired outcome here will be measured in terms of efficiency and how it is related to policy. Policy is expected to improve organisational efficiency from the literature presented, which leads to the following hypothesis:

H_0^1 There is no relationship between organisational efficiency and policy.

H_1 There is a relationship between organisational efficiency and policy.

In hypothesis 1, organisational efficiency is considered to be the independent variable and policy is the dependent variable. The null hypothesis is that the relationship between organisational efficiency and policy is zero. The alternative is that there is a relationship between organisational efficiency and policy.

Policy documents may be closer to policy discourse than to policy practice. In this regard, it is fundamental to complement any research of policy frames with a concrete and detailed analysis of actual policy measures. This is emphasised by the Immigrant Citizens Survey which forms part of the work of the King Baudouin Foundation to bring immigrants' voices into the public discussion on migration and integration. Immigrants are at the centre of these debates in many European Union member states, but the immigrants are hardly visible in the debates.

Huddleston and Tjaden (2012) find in their research that the European Indicators of Migrant Integration (also known as the Zaragoza indicators) use 14 core outcome indicators to monitor whether foreign or foreign-born people have an equal position in society in terms of their employment, social inclusion, education and active citizenship. Still, these outcome indicators give integration actors no better idea of whether policies are having the intended (or unintended) effect and, again, why or why not. These diverse reasons and relationships that drive the integration process cannot be captured by indicators alone. More types of data and analysis are necessary to evaluate how integration policies interact with many other policy, societal, and individual factors to affect the integration process (Huddleston & Tjaden, 2012).

This means looking at the programmes in place and identifying in which of the three dimensions of integration they are to be categorised, what their main goals are, and whom they target. As said before, the research of integration policies cannot in general be limited to the analysis of explicit integration policy measures. Programmes addressing the population as a whole or specific socio-economic groups within it, regardless of whether they are of immigrant origin, as well as general institutional arrangements in areas such as education, health care, housing, and the labour market, may be as fundamental (or even more) in fostering (or not) the integration of immigrants. Neither should we overlook how these policy measures are implemented in practice or to what extent and how street-level bureaucrats, practitioners, and professionals adapt them to their own goals and possibly limited resources.

In this regard, Garcés-Mascareñas and Penninx (2016) sum up that the research of policy measures entails a triple difficulty:

- we must go beyond integration policy measures in the strict sense, which greatly expands the field of research;
- policy measures are seldom described in official documents and therefore are difficult to trace; and
- programmes are often constituted of a set of unwritten norms and practices which may vary across time and space.

2.4.4 A review of social integration as posited by Blau

According to Blau (1960), social integration prevails in a group if bonds of attraction unite its members and support the hypothesis that acceptance as a peer depends on approachability as well as attractiveness.

Attractiveness depends on the following.

- If the individual has high social status in the society at large, the members of the society are likely to find him or her more attractive than if his or her social status is low.
- If the values of the individual and the members of the society are similar, they are more likely to enjoy association with him or her and to be interested in having him or her as a companion.
- If the personality needs the individual expresses in social interaction are complementary to the needs of the members of the society, they may derive some special gratification from him or her that draws them to him or her.

In general, if a person's qualities are valued by the other members of the group, he or she will tend to be attractive to them. However, every individual has a large repertory of qualities, and which of these find expression in his or her conduct in a given group is, of course, not a matter of chance.

2.4.5 Socio-political approach to integration

The status of socio-political and academic backgrounds for the development of integration theory raises important questions about the relationship of individual approaches to each other. Moravcsik (1993), for example, focuses on political integration and the role of intergovernmental bargains, whereas neofunctionalists such as Stone, Sweet and Sandholtz (1997) see integration as a much more social process happening in part through what they call 'transnational exchange' between the societies of member states (see also Rosamond, 1995). All of these are respectable accomplishments in their own rights, and hardly testable against each other (Hix, 1998). Yet, at the same time, this does not necessarily make them incommensurable once there is a certain modesty introduced regarding the scope of the argument made.

2.4.6 Political approach to integration

Emery Reves developed a theory for global integration in a political sense (Reves, 2006). By the term integration in a political sense, various forms and interpretations of the term integration could be understood. It could be examined that two differentiations are involved in the broader term of integration in a political sense. The first one is based on a segment variable:

- Political integration,
- Economic integration.

The second one is based on a *geography* variable:

- Regional integration,
- Global integration.

Figure 2.2 represents the analysis of integration in a political sense.

- Common goals (achieving security of life, freedom, property, common welfare, global, perpetual peace).
- First methods of achieving the goals (individual integration in a political sense and global integration in a political sense, establishing (global) political community).
- Second methods of achieving the goals (limiting the individual freedom or autonomy and limiting the state sovereignty, establishing law frame).
- Third methods of achieving the goals (establishing common institutions and decision-making centre).

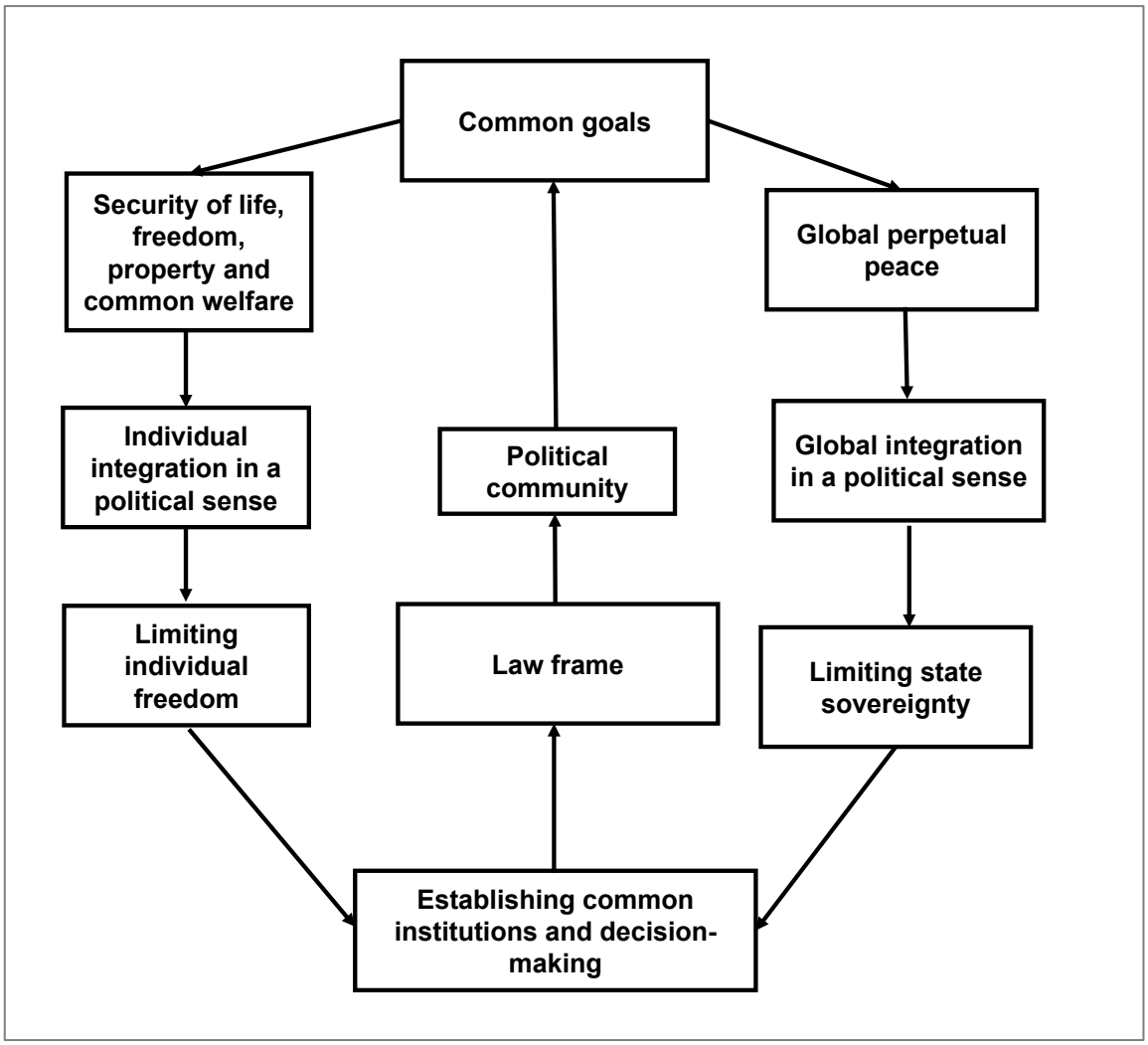

Figure 2.2: Analysis of integration in a political sense

Source: Ilievski (2015)

The last categories – regional integration and global integration – could correspond with the first categories of political and economic integration. It would be in the same scope with the integration in a political sense.

2.4.7 Economic approaches to integration

Ernst Haas, distinguished academic of European integration and neofunctionalism, defines the political integration, as “the process whereby nations forgot the desire and ability to conduct foreign and key domestic policies independently of each other, seeking instead to make joint decisions or to delegate the decision-making process to new central organs” (Lindberg, 1963). The definition provides the benchmark for several essential factors of political integration. These are:

- political integration is a process;
- making joint decisions;
- delegation of the activity of decision-making;
- certain policies of decision-making; and
- new central organs.

The heart of neofunctionalist theory is the spill-over effect. The integration from one sector is initiating the integration of another. The concept of integration (in a political sense) contains the concept of economic and political integration as two concepts. Leon Lindberg qualified the economic integration, as a concept of a political nature (Lindberg, 1963). This statement could be connected with the spill-over effect, and according to it, the economic integration could be an initial point for activating the process of political integration. The integration of economic policies, spontaneously following the neofunctionalist logic, could stimulate the integration in political matters. The both types of integration are interdependent, perceived from the angle of neofunctionalism (Ilievski, 2015).

The political union as depicted in Figure 2.3 below, that is incorporated as a final stage in the process of economic integration, is also the result of the finished political integration process.

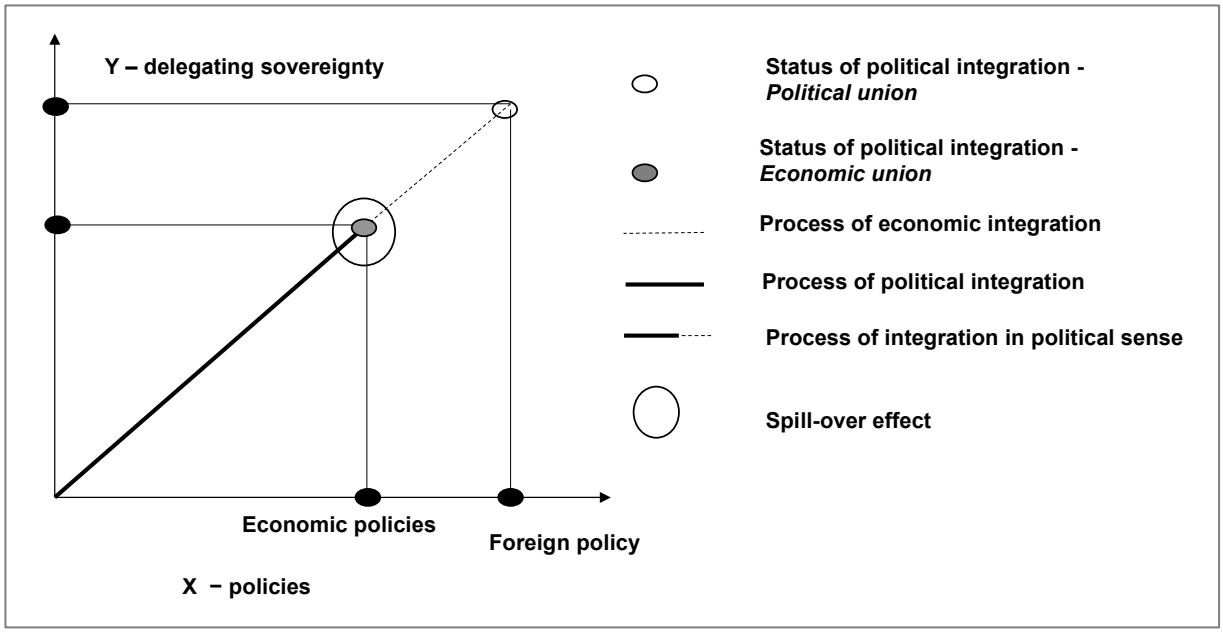

Figure 2.3: Political integration in the function of neofunctionalism

Source: Ilievski (2015)

According to Figure 2.3, the process of economic integration and the process of political integration project the same end that corresponds with the full integration. Following this reasoning, it is plausible that the process of political integration could be started by an ongoing process of economic integration, as a result of the spill-over effect. The initiation of the process of economic integration, instinctively would lead to the commencement of the process of political integration (Ilievski, 2015). The both processes of integration, in their last stages, would lean towards becoming one single process of integration (in the political sense), inclining to attain full integration, or political union. Therefore, it could be argued that there is a relationship of dependency between the processes of political and economic integration.

2.4.8 Summary of the mosaic of approaches

These approaches offer different perspectives that are largely determined by the contexts in which they are developed. At the extremes of this debate are, on the one hand, the notion of scientific progress and that the concept of political integration on the other, involves several interpretations, and the activation of the process of political integration is based on the concept of a spill-over effect, derived from the theory of neofunctionalism. The concept of political integration is a sub-category in the broader category of integration in a political sense. It is proposed here that integration results from social policymaking and can be identified through the literal meaning of integration: to make parts into a whole.

2.5 INTEGRATION AS A PROCESS

The next section provides the development of integration.

2.5.1 Integration as a two-way process

The process of integration of newcomers into an established society requires political intervention (for example, policy). The next question is: who are the relevant parties that are involved?

Entzinger (2000) says first, there are the immigrants themselves with their varying characteristics, efforts and degrees of adaptation, Secondly, we find the receiving society with its characteristics and reactions to newcomers. It is the interaction between the two that determines the direction and the temporal outcomes of the integration process. However, these two 'partners' are fundamentally unequal in terms of power and resources. This alludes to the fact that immigrants have less power than the established society when integrating into the host country. The receiving society, especially its institutional structures and reaction to newcomers, is far more decisive for the outcome of the process than the immigrants themselves are.

2.5.2 From a two-way to a three-way process: the EU concept of integration

Garcés-Mascareñas and Penninx (2016) say that integration was conceived as a balance of rights and obligations, and policies took a holistic approach targeting all dimensions of integration (including economic, social, and political rights, cultural and religious diversity, and citizenship and participation). The reference to integration as a three-way process relates to the European Commission's (EC) recent departure from viewing integration as a strictly two-way process (between migrants and the receiving society) to now acknowledge "that countries of origin can have a role to play in support of the integration process" (EC, 2011). Historically, the forerunners of integration studies, classical assimilation theories, defined settlement and incorporation as a more or less linear process in which immigrants were supposed to change almost completely to merge with the mainstream culture and society.

2.5.3 Processes to economic integration

Grimwade (2013) refers to the term "economic integration" to describe a process whereby the economies of several different countries, often in close geographical proximity, are bound together into a single region. According to Balassa (1961), in the twentieth century, no important customs unions were formed until the end of the Second World War, although many

efforts had been made to integrate the economies of various European countries. A certain amount of integration was achieved during the Second World War via a different path, Germany tried to integrate the satellite countries and the occupied territories with Germany economically. In the latter case, economic integration seemed like a form of imperialist growth. Table 2.2 refers to the different types of economic integration.

Table 2.2: Tabulated types of economic integration

Negative integration This may happen through a process of governments reducing barriers to the free movement of goods and services, persons or capital.
Positive integration Through governments creating common policies and institutions for the purpose of regulation and control.
Deep integration These are measures applied at the border (e.g. tariffs and quantitative restrictions).
Shallow integration These are domestic or 'behind the border' (e.g. harmonisation, service liberalisation, investment liberalisation, competition policy).

Source: Grimwade (2013)

Arespa (2015) found that in the research of macroeconomic unpredictability and international integration the main outcomes can be summarised as follows: "Financial integration and trade openness do play a role in macroeconomic volatilities. The greater the degree of openness attained by a country, the more likely financial integration is to help." This has been influenced by the growing importance attached by trade theorists to the role played by geography in shaping the patterns of specialisation and trade between countries. These have served to demonstrate that, under certain conditions, regional integration can be beneficial to the countries involved, without harming the rest of the world (Grimwade, 2013).

2.5.4 Summary of the integration processes

In brief, economic integration means having to open one's borders to new linkages with the rest of the world. Such a decision has obvious benefits, but it can also be the source of uncertainties. It is crucial that authorities are aware of how their economies will be affected.

2.6 CASE STUDIES OF REFUGEE INTEGRATION

According to Eastmond (2011), the personality of migration to 'northern' states changed from the late 1980s. Globalisation and increasing economic inequalities, failed states and ethnic conflicts with immense exclusions of residents caused a dramatic rise in the number of people looking for asylum.

2.6.1 United States refugee programme

The research by Brandt (2010) on refugee resettlement of migrant worker integration in Philadelphia attempted to comprehend what are the circumstances under which refugees integrate effectively in urban areas. According to Brandt (2010), about 60 000 refugees arrived in the United States in 2008, many of them arriving in urban areas. Refugee communities face ongoing obstacles to integration in host communities despite their access to provisional social services. The resettlement programme includes strategies for assistance programmes for refugees to achieve the objective of integration, which was understood as economic independence, within 4-8 months from arrival. Particular emphasis on refugee integration acknowledges the long-term nature of the process in which a refugee becomes a dynamic member of society though legal, social, economic, educational, and cultural means. Therefore, the initial integration period is important in simplifying long-term achievement for a refugee community. Planning programmes are an integral process of the continuing methods that policymakers and governments need to guarantee that refugees are integrated effectively.

2.6.2 Swedish refugee programme

According to Eastmond (2011), in Sweden the increase in numbers of refugees in 1989 was followed by another increase in 1992 at the start of the war in Bosnia. The complex diversity of people looking for admittance presented another difficulty for governments in the north. From the discussion by Eastmond two opposite dialogues regarding refugees became prominent in Sweden and other parts of Europe in the 1990s, as the global movement grew progressively.

- First, dialogues of panic and uncertainty based upon the belief that refugees were the ‘unwanted other’.
- Secondly, refugees were thought of as the troubled sufferers of war. Based on divided positions on reception, each had its own set of descriptions of those knocking on Sweden’s doors.

2.6.3 Baltic experiences and learnings on integration

The research conducted by Melnikas (2008) focused on the Baltic experiences of socio-economic integration. The important research factors in the area of formation of the unified social, economic and technological space in the Baltic region are the following:

- the research of the commencement of the Baltic region as a whole, including groundwork and assessment of numerous system indicators of the Baltic region,

- the intricate examination of the terms of centripetal and centrifugal forces developing in the Baltic region as a system.

Furthermore, integration processes in the Baltic region recognised a knowledge-based society and knowledge economy creation could be defined as a multifaceted change with the qualitatively new societal life focused on priorities. It means that the change representative of the new quality focused on changes in society and in the social economic life are a critical part of the political, social, economic, technological development processes overall. According to Lavingne (1995), the understanding of the Baltic region as a whole comprises the following significant problematic sections:

- the harmony of the Baltic countries and combined activity system and the assessment of the effect of these movements;
- the particular characteristic structures of the countries, due to their united difficulties and integration problems; and
- external and internal influences and locations, identifying their integration scenarios and boundaries.

Furthermore, the Baltic region's economic integration can be connected to the real economic policy formation and implementation, predicting that the region's economic integration should be concerned with social, economic and technological development urgencies. The argument reflects the region's economic integration as wide-ranging, multifaceted, and a contrasting landscape of economic growth problems. These problems and answers are viable only if guidelines to an actual and wide scale integration movement are designed (Melnikas, 2008).

It was found that the creation of the combined social, economic and technological space in the Baltic region could be defined as a significant requirement for further transformation and more concentrated and dynamic integration of the national societal and economic systems in the Baltic countries into the common European and international growth development.

2.6.4 Summary of the case studies

The development of a cohesive social and economic process could be defined as an important precondition for further modernisation and more intensive and active integration of the national societal and economic systems.

2.7 THE FACULTIES OF MANAGEMENT INTEGRATION

This section presents the different faculties of integration.

2.7.1 Integration in education

Faulder (2005) suggests that the utilisation and existence of technology in education is as old as the field of education itself. This starts with more modest tools like chalk and slates and then moves toward the more difficult tools of personal computers and their hardware and software components. ICT integration is a multifaceted phenomenon which involves a substantial number of aspects. Educators generally get the blame for unsuccessfully integrating ICT in the classrooms. Moreover, Sharma (2014) states that educator learning should not be limited to scientific teaching and classroom theory. Lazarus, Kauffman, Kothari, Mosher, Silvis, Wawrzyniak, Anderson and Black (2014) indicate that in the medical field, 3-D animation is an emerging field in medical education and usefulness is being considered in the medical community. A 3-D animation video developed under the guidance of medical professionals from various disciplines could enhance deeper understanding and spatial knowledge of medical students. Analysis from the medical students using the 3-D animated medical models showed a positive result when compared to the control group of students taught with a 2-D PowerPoint presentation as reported in the research. Rydhagen and Dackman (2011) indicate that the integration of sustainable development into engineering education requires a change in epistemological values. Furthermore, education needs to open up for reflection and discussion, both for deeper understanding and as a preparation for future work, which in many cases involve complex stakeholder negotiations and decision-making.

2.7.2 Integration in the field of medicine

On 24 May 2014 at the 67th session of the World Health Assembly in Geneva, the World Health Organization (WHO) published its resolution titled “Strengthening of Palliative Care as a Component of Comprehensive Care throughout the Life Course’”. It recognised that 40 million people require palliative care every year and that the avoidable suffering of treatable symptoms is perpetuated by the lack of knowledge of palliative care. According to Elsner, Centeno and Ellershaw (2016), projections from the European Union suggest that by the year 2050, the proportion of the European population over the age of 65 years will rise from the current 17% to 28%.

What are the most appropriate approaches and methodologies to integrate palliative care? According to Elsner et al. (2016):

- Generally, educational approaches, it is suggested that parts such as experimental education including practise in in-patient units, hospital consultative service and

community settings composed of meetings with patients and their families should be incorporated. Debriefing and reflection should be considered as highly important.

- Energetic rather than inactive procedures should be employed including problem and/or case-based learning, conversation and role play. Multi-professional knowledge should be encouraged to foster cooperation. Specialists in palliative care should be aware of areas of palliative care taught by co-workers in other disciplines.
- Repetitive junctures for self-reflection and group deliberations of problematic circumstances, including family issues, team problems and grief, should be agreed and ethical and psychosocial concerns should be integrated into all aspects of teaching. A mature population is likely to lead to a higher number of patients with cancer and other chronic, incurable diseases, needing increasing palliative care provided at the end of the lifespan.

Furthermore, in research conducted by Santos, Edwards, Santos, Rogatto, Achatz and MacDonald (2013) in the field of genomic care show that the rapidly evolving field requires that nurses be aware of developments in genomics and its influence on risk assessment, prevention, diagnosis, and management. Knowledgeable nurses can integrate evidence-based interventions and expert professional guidelines into practice to improve overall health, quality of life, and safety of patients.

Narahari, Ryan, Bose, Prasanna and Aggithaya (2011) report that the Indian government has 106 traditional systems of medicine. Only seven, Ayurveda, yoga, Unani, Siddha, and homeopathy (called AYUSH), are taught in universities. Ayurveda has been one of the most recognised and utilised systems. The process of education and training is thorough and needs 5.5 years of learner schooling and three years of postgrad exercise, although this is not widely acknowledged by bio-medically trained dermatologists. The incorporation of bio-medicine with other systems of health care is increasingly accepted and is reinforced in many countries around the world including the United States of America and the United Kingdom. The purpose of the research article by Narahari et al. (2011) was to develop integrative dermatology treatment protocols for patients with long-standing skin diseases who have received treatment from many centres. Their research found that integration at the healing level is possible, although the pathological basis is interpreted differently. The principle guiding the integration of skin care treatments was the point that each system of medicine recognises the same disease, although their descriptions show slight dissimilarities. Narahari et al. (2011) found in their research in India regarding Ayurvedic medicine that although the reality of over 700 000 biomedical practitioners and equal numbers of AYUSH doctors who endeavour to mirror work

in other centres within India may encounter confrontation for non-scientific motives. Inherently, amongst practitioners, there still remains some degree of unfamiliarity with other systems.

Each system of medicine prescribes integration based on the pathophysiological understanding of the respective literature. Therefore, judging by patient response assessed on the basis of outcome measures derived from biomedical dermatology, it is evident that integration at the level of therapeutics is possible.

2.7.3 Integration in sport science

Research conducted by Young, Klossner, Docherty, Dodge and Mensch (2013) find that student integration into an athletic training education programme (ATEP) perceived that differences exist in how athletic training students are integrated into their clinical experiences between those students who leave an ATEP and those who stay, described as persisters and dropouts. From a clinical standpoint, the following key points that are highlighted:

- Scientific integration effects the retention and attrition of students in athletic training education programmes (ATEPs). In particular, provision from clinical coaches and peers has a significant effect on student retention.
- Accurate clinical education practices are significant for scholars and provide a platform for scholars that lead to improved feelings of motivation and therefore expert efficiency.
- Time and dedication was a challenge to keep the students who were passionate in the ATEP and played a significant role in the programme.
- Commitment and realising the need in reality, genuine learning and good prospects allowed students to align to their new professional role which leads to augmenting retention in the ATEPs.

Their findings indicate that instructors can increase retention by highlighting genuine observed learning chances rather than hours worked, by permitting scholars to take on more accountability, and by enabling systems of care within clinical education practices. In addition, the research exposed that the persisters and dropouts were not the same on the academic and social integration scales. Together, the clusters were correspondingly integrated within the academic and social aspects of the ATEP. Therefore, retention and attrition within athletic training education appeared to be more connected to clinical integration, enthusiasm, and anticipatory factors and to have less to do with educational and societal integration.

2.7.4 Integration in business: mergers and acquisitions

Mergers and acquisitions (M&A) are widespread planned undertakings and are estimated to increase (Bloomberg, 2012). Furthermore, according to the 2012 Global M&A Outlook, more than 24 700 deals were introduced with more than $2.11 trillion in overall volume by the end of November 2011. Part of the difficulty organisations encounter throughout the M&A processes is integration. By using a cross-case research of 311 centres in New York and Philadelphia, critical success factors and challenges of service integration were undertaken by Nam and Pardo (2014). The research question they attempted to answer was what affects service integration in a contact centre? While the absence of interoperability remains as a challenge to system level integration, customer service agents play an important part in connecting non-interoperable systems to front office systems and back office systems. Thus, teaching for skilled customer service specialists is key to the continuous operation of 311 contact centres. Territory defending often causes intra-organisational issues although top management intervention helps to resolve these issues. Nam and Pardo (2014) categorise a set of critical success factors for integrating service and information requirements into a single combined network. Multidimensional factors for the success of service integration initiatives include timely investment in the most essential technology, adaptive plans to prepare with technologies essential for service integration, teaching for customer service specialists with the required ability and knowledge, the decision-making management, political supporters, and internal and external stakeholders throughout the business.

2.7.5 Integration in information technology

Chang, Chang and Wang (2014) indicate that to integrate information systems successfully, the organisations need to follow an organisation's complete IT strategy and integrate both the organisations' systems to have a standardised IT function. An overview of the plan between management fields and dimensions from this case research is given in Table 2.4. For example, the dimension of integration of IT human resource management processes highlights training and motivation of a firm's IT human resources. Since the organisation might come across resistance for the period of the information system integration, the experiences of IT personnel have improved and related training must be completed. The related management fields found in the case research, such as competencies of the technical section, cultural battles, staff confrontation, change management, employee teaching, and faith and support of staff, were grouped in the dimension of integration of IT human resource (HR) management processes.

Table 2.4: A summary of mappings between management fields and dimensions

Dimensions	Management fields

Integration of IT infrastructures	Interface integration Technology integration Standardisation Customisation modification
Integration of IT applications and data	Software integration Data integration Process integration Participation and evaluation of professionals Database integration System integration
Integration of IT HR management processes	Capabilities of technical department Cultural conflicts Staff resistance Change management Employee training Faith and support of staff
Integration of IT strategy-making processes	Clear target definition Organisational resources Plan establishment System costs Communication and coordination Support of managers Use of time and cost Raising of questions Construction and system
Integration of IT vendor management processes	Continuous support of suppliers and consultants

Source: Tanriverdi and Uysal (2011)

Chang et al. (2014) indicate that the integration of ISs is important for the achievement of M&A processes. However, given the complex nature and the exclusivity of each M&A process, such a role needs further investigation and can provide additional insights within different M&A contexts. Their results recommend that although organisations have proper communication and cooperation among staff members this leads to a clear objective and the support of IS integration. Nevertheless, the cultural conflicts and the operating changes still cause confrontation and change of management. More significantly, the IS integration process shows the significance of the influence from both organisations better to integrate the operating requirements. As discussed, their research offers understandings and recommendations on how to achieve IS integration in the era after the M&A, which in turn may consequently result in M&A success.

2.7.6 Synthesis of integration as demonstrated in the different fields of research

The varied methods in the area of integration can be viewed as different viewpoints on the topic of integration with each contributing to the general understanding of the subject. They cannot easily be taken collectively to form a majestic philosophy of integration because one finds it necessary to accept one's own standpoint in order to make the different viewpoints operational. Instead, one might see them as an assortment in an always unfinished mosaic.

2.8 EXTRAPOLATION OF THE VARIED DEFINITIONS OF INTEGRATION AS RELATED TO BUSINESS MANAGEMENT

Table 2.5 provides definitions of integration from different fields of integration.

Table 2.5: Scholarly definitions of integration

Author/s (year)	Definition
Blau (1960)	Integration is the process whereby two or more actors form a new actor. When the process is completed, the actors are said to be integrated. Conversely, disintegration is the process whereby one actor splits into two or more actors. When the process is completed, the actor is said to be disintegrated.
Lindberg (1963)	Ernst Haas, eminent researcher of the European integration and neofunctionalism, defines the political integration, as the process whereby nations forgot the desire and ability to conduct foreign and key domestic policies independently of each other, seeking instead to make joint decisions or to delegate the decision-making process to new central organs.
Galtung (1966)	Defines integration as the process whereby two or more actors form a new actor. When the process is completed, the actors are said to be integrated. Conversely, disintegration is the process whereby one actor splits into two or more actors. When the process is completed, the actor is said to be disintegrated.
Garvin (1991)	Integration is the complete harmony and alignment of strategy and operations of an organisation. It means that different departments and levels speak the same language and are tuned in to the same wavelength.
Ackoff (1999b)	From the above, an integrated management system can therefore be defined as a system with a set of standards, each standard could be considered as one of the elements making up the system. And if these elements or standards are separated then it will lose some of its essential properties.
Korac (2003)	In immigration studies literature, integration is understood in terms of social service provision by the receiving society and access to social services that facilitate settlement.
Beckmerhagen, Berg, Karapetrovic, Willborn (2003).	The integration of MSs can be understood as putting together different function-specific management systems into a single and more effective IMS.

Author/s (year)	Definition
Esser (2004)	Integration is the inclusion [of individual actors] in already existing social systems.
Heckman (2006)	Integration is a generations-lasting process of inclusion and acceptance of migrants in the core institutions, relations and statuses of the receiving society.
Patience (2008)	Integration means a combination; that is putting all the internal management practices into one system in such a way that the components of the system are not separated but linked to form one integral part of the organisation's management system. In simple terms, an integrated management system (IMS) is a management system which combines all the components of a business into one coherent system so as to enable the achievement of its purpose and mission.
Brandt (2010)	Integration is described as the absorption, acculturation, assimilation, incorporation or integration revealing the complexity and ambiguity associated with the topic.
Ramphal (2012)	An IMS is meant to eliminate employee confusion.
Turof (2012)	An IMS is a logical and systematic management approach that allows strategic and operational decisions that best address all the key issues that lead to the effective functioning of an organisation, both in terms of quality and safety, or the environment and health.
Gopalakrishnan, Chandramohan and Maheswari (2015)	Integration begins with complete understanding and common use of systems and standards.
Carvalho et. al, (2015)	Refer to an integrated management system (IMS) as a set of interrelated processes that share human resources, information, materials, infrastructure, and financial resources. The IMS is organised in order to meet goals related to satisfying different stakeholders. Several individual management systems and frameworks therefore exist in an organisation for its proper functioning.
Garcés-Mascareñas and Penninx (2016)	The term 'integration' in the social arena refers to the process of settlement, interaction with the host society, and social change that follows immigration.

2.8.1 Summarised definition of IMS related to business management

Integration is a process of incorporating different levels of an organisation seamlessly, who share common strategic goals, and which interconnect in a cohesive manner to ensure the efficacy of all stakeholders.

2.9 AN EXOGENOUS REVIEW OF SCHOLARLY LITERATURE ON IMS

This section presents a review of management systems integration.

2.9.1 Defining a management system

In the 1960s, we find the earliest integration aspects in technology were management systems transfer and assessment were integrated with business strategies (Jemala, 2012).

Organisations are always under enormous stress to achieve organisational objectives and satisfy their stakeholders (Karapetrovic, 2008). The efforts to fulfil the needs of internal and external stakeholders through the achievement of business operations are often facilitated by management sub-systems that provide an efficient and structured manner to control the behaviour of the system so that it constantly behaves in the preferred manner. As the number of standardised management sub-systems has been amplified, their integration becomes a requirement. Organisational results are demonstrated as a result of the managers' strategic choices, which in turn are determined by the manager-specific interpretation of a decision problem. Because of the complexity of these circumstances and the constrained cognitive capacity of managers, their judgement is limited to selective environmental and organisational stimuli.

ISO 9001 (2015) defines a management system as a set of interacting elements of an organisation to establish policies and objectives and processes to achieve thos objectives.

Dominquies, Sampaio and Arezes (2016) describe a MS as a set of interconnected processes aimed at realising several different goals by resource consumption, and its execution by an organisation does not imply a minimum level of organisational performance or the achievement of a pre-set result, although it should contribute to those objectives. Moreover, the management system (MS) of an organisation is frequently split into a number of parts or sub-systems which must be managed separately with relative independence. These independent parts reflect the different needs and expectations of the stakeholders (Rebelo, Santos & Silva, 2014). An MS clearly defines the goals and objectives, drafts the strategies and tactics and develops the plans, schedules and necessary controls to run the organisation. An MS could be defined as a set of interrelated processes aimed at achieving several different objectives by resource consumption, and its implementation by an organisation does not imply a minimum level of organisational performance or the achievement of a pre-set result, although it should contribute to those objectives (Dominguez, Sampaio & Arezes, 2015).

The IMS can be understood as "putting together different function-specific management systems into a single and more effective IMS" (Beckmerhagen et al., 2003). In simple terms, an IMS is a management system which combines all components of a business into one coherent system so as to enable the achievement of its purpose and mission (Chartered Quality Institute, 2007).

Past decades had seen the adoption of an MSs as a means to fulfil the requirements of quality. Referring to the concept of synergy, Ansoff (1965:35) defines the term as "the effect of 2 + 2 = 5", i.e. the effect whereby the integration of various elements produces maximisation

of the qualities of each element with a score higher than that which is derived from the simple sum of the elements.

Similarly, Maiera, Vadastreanu, Keppler, Eidenmuller and Maier (2015) indicate that a management system of an organisation can include different management systems, such as a quality management system, a financial management system and an environmental management system.

Therefore, in brief, an MS can be defined as a set of activities that aim to achieve the strategic objectives of an organisation by enabling resources and processes to achieve their goals.

2.9.2 The motivation of IMS in organisations

Rebelo et al. (2014) found that organisations are populated with a huge variety of independent MSs. An IMS tends to integrate some or all the components of the business. Maximising their integration in one comprehensible and efficient MS is increasingly of strategic importance and constitutes an opportunity for businesses to be more competitive and consequently, promote its sustainable success.

Low integration level organisations (LILO) and high integration level organisations (HILO) were identified by Almeida, Domingues and Sampai (2014). Given the incentive that led the organisations in their research to integrate their management subsystems, respondents considered corporate image improvement, stakeholders' relationship improvement, processes optimisation, documentation reduction and internal organisation improvement as the main motivations towards management system integration.

Table 2.6: Motivation for management system integration in an organisation

Motivation	HILO		LILO	
	A	B	C	D
Marketing tool/image improvement	x	x	x	x
Internal process optimisation	x	x		
Marketing differentiation				
Give response to customers with specific demands	x			
Improve effectiveness and systems control	x			
Top management decision		x		
Economic support for investment projects		x		
Cost reduction associated with resources involved		x		
Customers and suppliers relationship improvement			x	
Internal organisation improvement			x	
Documentation reduction			x	x

From Table 2.6 there is a clear difference between the two organisations groups – one may verify that the HILO group indicates motivations related to the system optimisation and efficiency improvement, and the LILO one indicates the documentation reduction as the main motivation for integration.

To summarise, those organisations that are faster and more well-organised in their integration and continuous enhancement will have a competitive advantage in gaining a workable value in our global and competitive business world.

2.9.3 A review of the levels of the IMS

In his work, integration theorist Galtung (1966) found that there are three levels of integration.

- **Territorial integration:** Joining nations by the principle of vicinity, because they are located close together.
- **Organisational or vertical integration:** Joining nations by the principle of division of labour into an interdependent system. This is usually referred to as neo-colonialism.
- **Associational or horizontal integration:** Joining together nations by the principle of affinity, because they have some kind of similarity. This is usually referred to as functionalism, and leads to an international, governmental organisation.

The levels presented above consist of internal embeddedness of the IMS and external interaction with stakeholders. It involves a culture of learning, continuous improvement and stakeholder involvement.

Different levels of integration have been distinguished. For example, Hines (2002) distinguishes two levels of integration known as alignment and integration.

- **Alignment**: this is when the similarities of the standards are used to structure the system. The purpose is to reduce administrative and audit costs. There are still separate procedures for each system, but all are placed together.
- **Integration:** This is a complete integration in all significant procedures and instruction. There is embeddedness in the organisation and close interaction with stakeholders.

Both these definitions focus on clients and continuous improvement to improve the efficiency of an organisation. The level that organisations require will depend on the complexity of the present management systems and the reason for pursuing integration.

Jorgensen et al. (2006) present the following three levels of integration which can be distinguished based on the synergy between the customer-based quality, product-oriented environmental management and corporate social responsibility.

- The **correspondence** level which focuses on the system aspect due to increased compatibility amongst the standards.
- The **generic** level which focuses on the processes or the structure due to coherence or coordination of different processes.
- The **integration** level which is a more strategic and inherent level of integration with a focus on embeddedness in the organisation and stakeholder relationship. This is more product chain oriented.

Jorgensen et al. (2006) present three levels.

- **Corresponding**: increase compatibility with references between parallel systems,
- **Coordinated and coherent**: a generic process focusing the management of the task cycle.
- S**trategic and inherent**: organisational culture learning, continuous improvement of performance and involvement of the stakeholders related to internal and external challenges.

The main components that may play significant roles in whether an organisation decides to integrate its management system and the level of the integration are the structure, size and economic sector. The research also showed that the IMS grew spontaneously and in the same way as the level of integration. In addition to the above, market competition and regulatory demands also have a determining role in its level of integration (Jorgensen et al., 2006).

Furthermore, integration can be partially or completely focused on aspects such as goals and objectives, system documentation and procedures (Sampaio, Saraiva & Domingues, 2012). For example, Bernardo, Casadesús, Karapetrovic and Heras (2009:) claim that organisations follow a pattern with respect to documentation and procedures that make up the majority and it seems clear that it starts with strategic objectives, better documentation and procedures, leaving the integration of operations and tactics later. However, the role of the people involved in integrated management systems is not important, contrary to what is stated in the theoretical literature and in the standards of application. Dordević, Bešić, Milošević and Bogetić (2010) posit that it is possible to find three factors that have an effect on the development of integrated management systems, namely:

- enhancement of the organisation's overall features;
- creation of frameworks for implementation; and
- creation of an integrated scheme for independent controls of integrated management systems.

Therefore, it can be summarised that, although the geographic area and organisation sector have an influence on the organisation in adopting the management systems and their integration, is seems that the organisation size exerts the greatest influence. If properly accepted in an organisation, an IMS will lead to continuous improvement of performance, competitive advantage and increased sustainable development. If an organisation chooses to integrate their management system, they may aim for one of the above levels of integration.

Therefore, the factors that play a part in the determination of the level of integration of an organisation are its size, economic sector or function, structure, market competition, regulatory demands and geographic location.

2.9.4 IMS frameworks

Over time, there have been several studies (see Bernardo, 2014; Douglas & Glen, 2000) on integration concepts and frameworks of various management systems (especially those based on ISO 9001, ISO 14001 and OHSAS 18001, Carvalho et al. 2015) highlighting the advantages and disadvantages of the models studied. Additionally, the most important common features in terms of a concrete approach to designing, implementing and operationalising the models of management systems, as defined by the international standards is promoting the principle of continuous improvement, focusing upon problem prevention, placing the human factor within the centre of the design process, and implementing and operationalising each management system (Olaru, Maier, Nicoara & Maier 2014). The organisation must design,

implement and maintain an integrated management system focused on customer satisfaction and fulfilment of all stakeholders' expectations. In designing such a well-structured and effective system, emphasis should be placed on identifying existing or potential problems related to quality, the environment, health and occupational safety, and on implementing required preventive and corrective actions.

An IMS framework will typically have the following characteristics (Dalling, 2007):

- Its scope will cover the totality of the organisations' processes and systems and embrace health, safety, environment, security, human resources, finance, marketing, and public relations as relevant to the organisations' values, operations and objectives.
- It is formally defined in a uniform style that only varies where necessary to meet its purpose, for example, description of broad principles as opposed to a defined sequence of steps to be followed in a process.
- While ensuring the effectiveness of the IMS, replication of documentation is minimised.
- The structure of an IMS does not follow that of a specific management standard or item of legislation, but is designed to control and guide the organisations' processes in the most effective and efficient way.
- Each component of the management system takes account of all of the other components as appropriate.
- It addresses all relevant stakeholder key requirements transparently defined via relevant standards, legislation or other defined requirements.

Dordević et al. (2010) refer the crucial assessment of the achievement with respect to IMS implementation as the effectiveness of the continuous system enhancement process developed within the organisation. The IMS model illustrates a typical scheme for large organisations that consist of different departments and operate at many locations.

The same basic frameworks may be applied and defined as:

- system input;
- global management system;
- departmental/local management practice; and
- special instructions and processes.

Zeng et al. (2007) propose Figure 2.4, focusing on the importance of synergies in the implementation of an IMS.

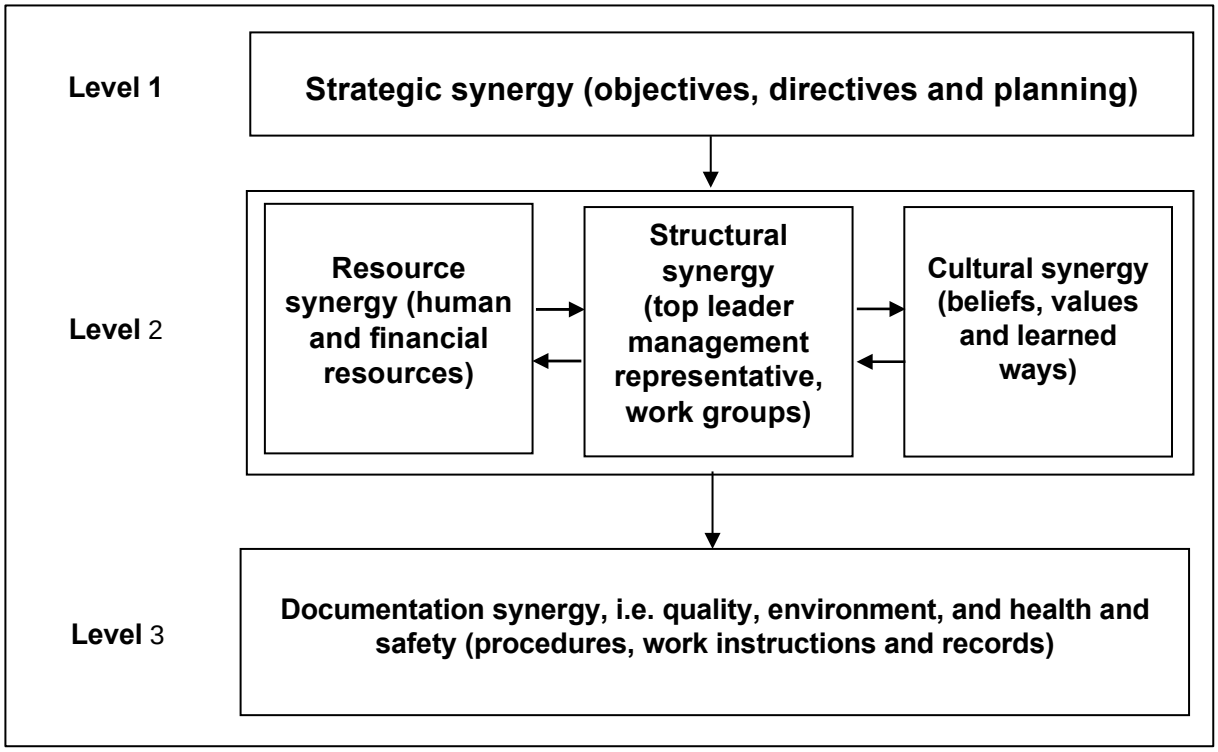

Figure 2.4: A synergic model of implementing IMS

Source: Zeng et al. (2007)

Figure 2.4 shows that the highest priority is given to the strategic synergy, because it leads to the fulfilment of long-term goals and thus more sustainability of the standards. At the second level, there are three elements of strategy, resources, and structural and cultural synergy between the different management systems which play important roles (Zeng et al., 2007). The second level should be supported by the third level, documentation synergy in which a hierarchy should be followed beginning with the organisation's policy, values and principles related to the different management systems to be integrated (Zeng et al., 2007). This is done so as to meet the organisation's policy requirement. This model with emphasis on synergy can lead to the integration level if the third precondition, interaction with stakeholders is included, thus will obviously lead to the most ambitious level of integration (Zeng et al., 2007).

According to Dordević et al. (2010), IMS requirements from organisations participating in this process can be reduced to the following elements:

- structure transparency;
- starting points of continuous improvement;
- increase in productivity and efficiency;
- certificating option;
- using synergy through integration;

- simple system managing even by insufficiently trained worker; and
- consideration of the organisation's individual features.

Empirical research by Bernardo, Casadesús, Karapetrovic and Heras (2012) indicates that there is no single model that is suitable for all organisations as academic research has various models of integration at different levels. Regarding the integration system, Karapetrovic (2008) reports that there are three types of organisations:

- those that have only integrated documentation;
- those with integrated processes, objectives and capabilities; and
- those which have all the parts of an integrated management system in a single management system.

Asif, Bruijn, Fisscher, Searcy and Steenhuis (2009) distinguish between three published bibliographic streams of IMS frameworks.

- One relates to philosophical features, basic concepts and some issues about integration relevant topics.
- The second bibliographic stream relates to the challenges faced by organisations when they integrate their management systems (MSs).
- Finally, the third stream describes the models and integration strategies, the integration level and the sustainable development achievement through an IMS implementation.

In Figure 2.5 below, a schematic presentation of level, scope and extent for two organisations researched by Abrahamsson, Hansson and Isaksson (2010) is presented.

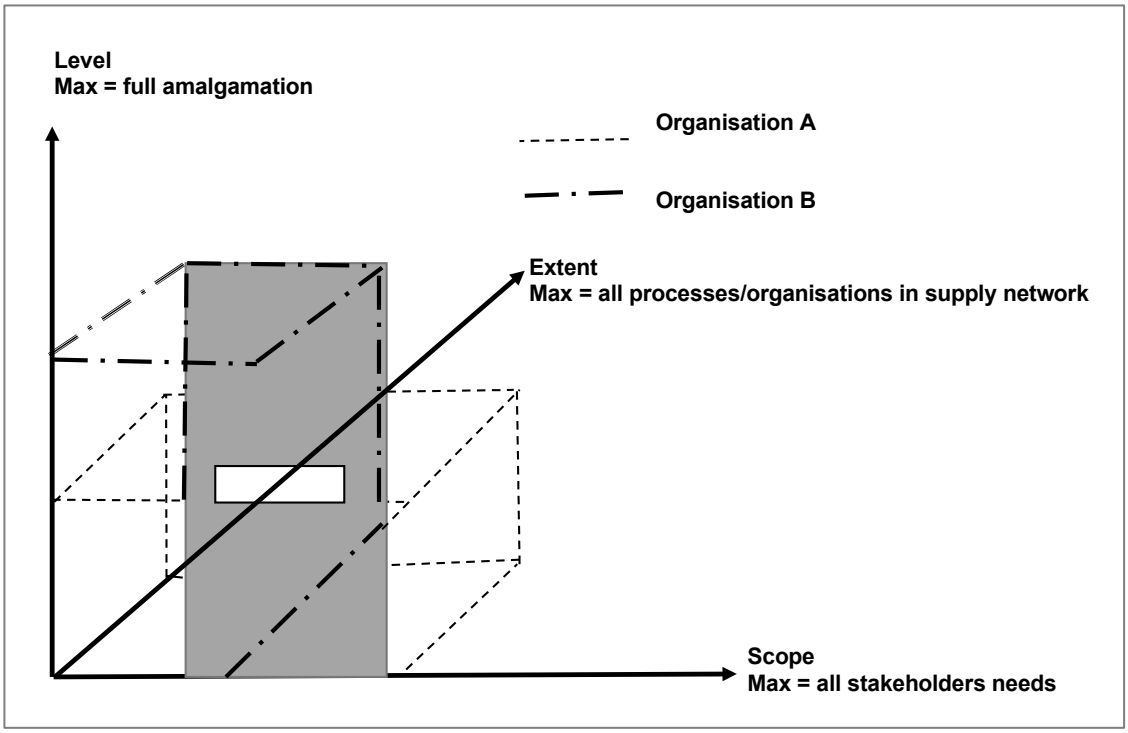

Figure 2.5: A schematic presentation of level, scope and extent of an IMS

Source: Abrahamsson et al. (2010)

Deployment would be studied in the different processes, the entire organisation and the supply network. The benchmark looking at level, scope and extent would be set based on a critical aspects analysis. That is, the benchmark would be different for different organisations. The level of integration should follow the general level of process orientation.

According to Asif, Searcy, Zutshi and Ahmad (2011), the integration of sustainability into business processes can be facilitated through an IMS approach. Such an approach provides both the flexibility and clarity needed to address the many issues associated with the management, measurement, and assessment of corporate sustainability. Building on that premise, a conceptual framework for corporate sustainability through the integration of MSs is shown in Figure 2.6. The framework builds on previous research conducted by:

- Mitchell, Agle and Wood (1997) who described a typology of stakeholders in relation to their requirements;
- Choo (1996), Daft and Weick (1984) and Weick (1987) who elaborated on environmental scanning to provide an informed understanding of the environment in which an organisation operates; and
- Asif et al. (2009), Jorgensen (2008) and Zeng et al. (2007) highlighted various levels of integration and how integration alters activities at each organisational level.

The framework also builds upon the research of:

- Rocha, Searcy and Karapetrovic (2007) by considering various perspectives on corporate sustainability integration; and
- Fresner and Engelhardt (2004) and Oskarsson and Malmborg (2005) by providing an integrated use of MSs to address key stakeholder requirements.

Figure 2.6 shows the process of integrating sustainability starts with the identification of key stakeholders and their requirements. Asif et al. (2011) posit, unarguably, that organisations are under pressure from a wide variety of primary and secondary stakeholders. A detailed environmental scan, including an assessment of strengths, weaknesses, opportunities, and threats and a stakeholder analysis, can assist a manager in determining what is important, what is not, and the level of urgency and priority to be given to various issues. It is particularly noteworthy to identify the legitimacy and urgency of stakeholder demands, as well as the relative power (and potential conflict) of the different stakeholders to influence the business, given that they (the legitimacy, urgency, and power of stakeholders) change over time. Environmental scanning is therefore, a mechanism for identifying key stakeholder demands and prioritising them within a framework of constrained resources (Choo, 1996). Building on the environmental scan, organisations make sense of their surroundings and also develop the appropriate context for adaptation and response. Figure 2.6 also shows that organisations may deploy a number of different MSs to meet key stakeholder requirements. These MSs guide the behaviour of a system and thus provide a systematic way to execute a function consistently over a period of time (Asif et al., 2011).

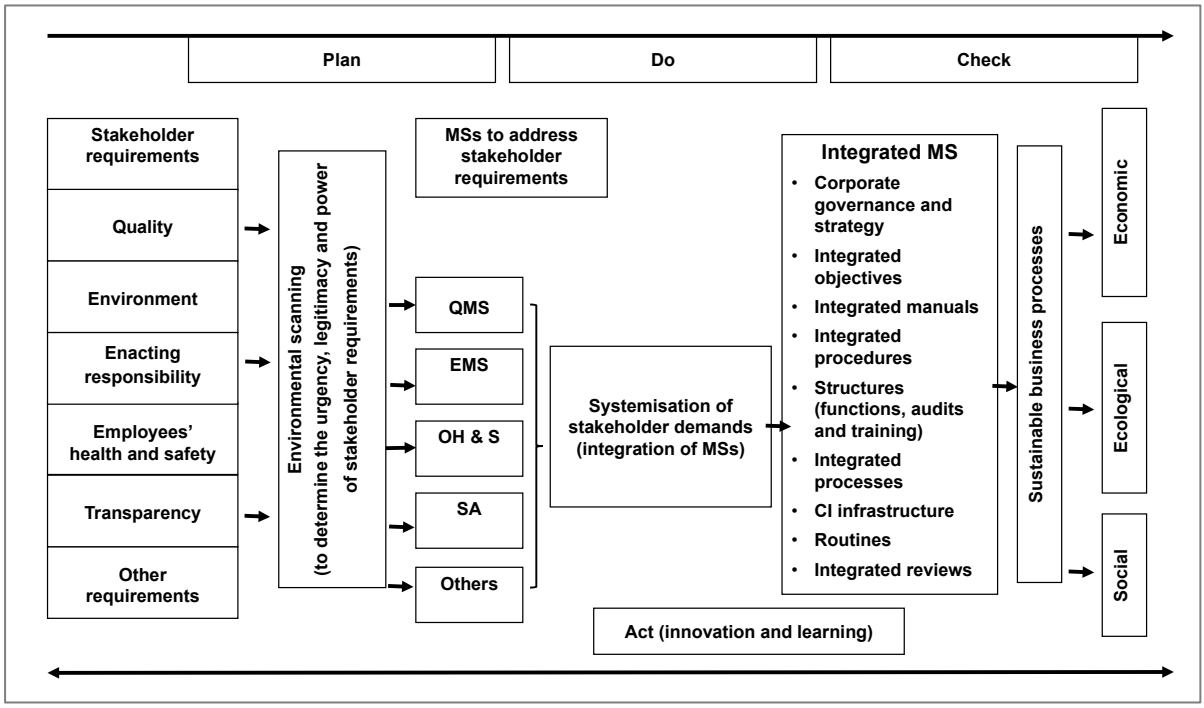

Figure 2.6: The framework for corporate sustainable development through an IMS approach

Source: Asif et al. (2011)

Additionally, in Figure 2.7 we can observe a central core management system sharing different requirements while specific ones are located in parallel functional modules resulting in a new system, thus constituting an integrated management system in which the components are interrelated, but without sacrificing their individual identity and without invading other management systems.

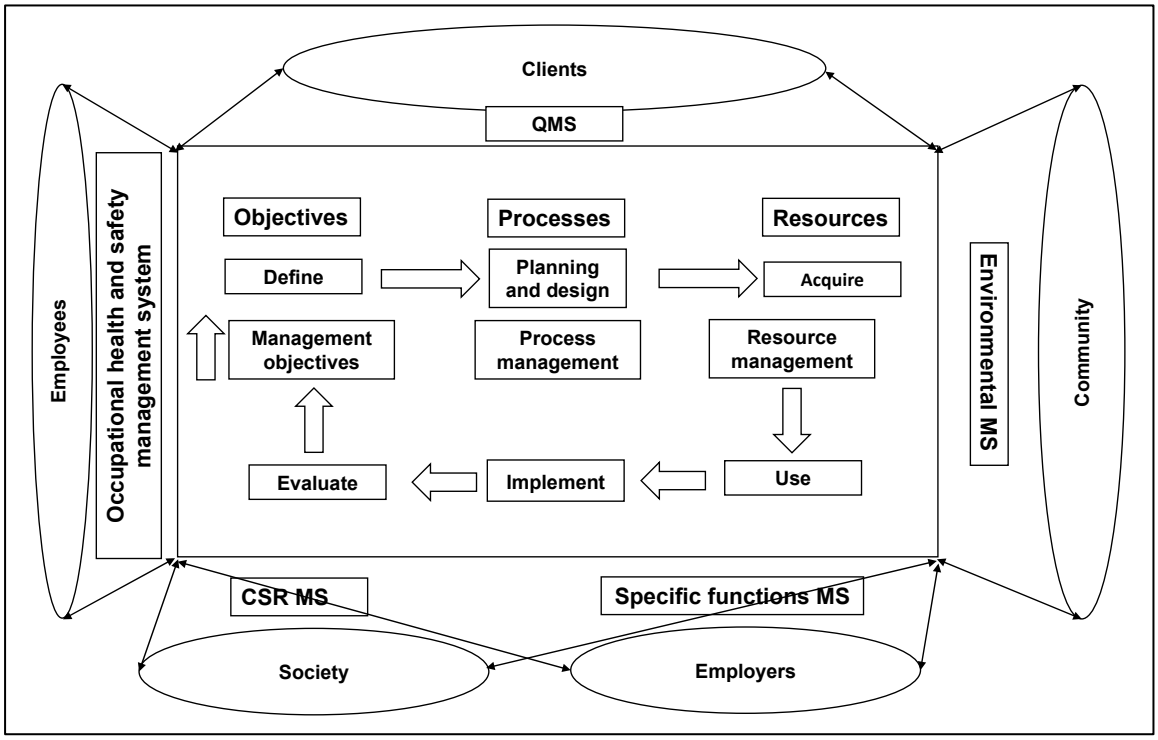

Figure 2.7: System integration

Source: Karapetrovic and Jonker (2003).

Simon and Douglas (2013) conducted research in Spanish and UK organisations and found that the elements which were integrated to a highest extent both in the English and the Spanish organisations were the procedures which were almost fully integrated in all the organisations. However, higher levels of integration were exhibited in MSs procedures, such as management review, record and document control, internal audits or preventive and corrective actions, while the elements integrated to a lesser extent were resource management, product realisation and internal communication.

To summarise, regarding the analysed models and frameworks, different results have been obtained depending on the number of MSs implemented:

- the IMS starts from stakeholder discussions to ensure effective communication with all stakeholders;
- the IMS promotes vertical and horizontal integration to ensure fit among various processes at different organisational levels; and
- the IMS develops the competencies and institutional knowledge for sustainability.

Despite the significant work conducted by IMS researchers, organisations need to develop a shared interpretation of knowledge effectively to deal with emerging problems and to understand their organisations and their surroundings better. In fact, Bernardo et al. (2012)

state that although the increased interest in understanding how these difficulties emerge and affect the resulting IMS, is still not clear and consequently there is still a dearth of empirical research on this critical aspect of an IMS. All the above studies contribute to the IMS. However, factors such as leadership, management, organisational culture, employee motivation, policy, innovation, standards, standardisation effort, efficiency and employee performance have not been exploited or researched to realise the relationships that exist between them.

2.9.5 Benefits of integrated management systems

Carvalho et al. (2015) show the benefits of integrating the systems. In their research, they used a questionnaire as their research instrument, which was sent to 176 organisations in Catalonia, Spain. Several benefits in integrating management systems where identified which namely:

- increase in employee motivation;
- higher collaboration;
- increase in organisational efficiency;
- increase in organisational culture;
- improvement of the organisational strategy, communication, and organisation image; and
- better use of the results of internal and external audit.

Asif et al. (2009) indicate that the main constructs can be broken down further to important areas identified as drivers for an IMS, namely operational, financial, regulatory, social and marketing drivers.

- **Operational drivers:** are related to the normal operations of the business. They are supply chain activities and identify important characteristics, such as productivity and efficiency.
- **Regulatory drivers:** are related to legal requirements for the environment, safety, health and corporate responsibilities or processes. They are measured in terms of legal non-conformances.
- **Financial drivers:** are related to financial gains from implementing an IMS. This can be a driver in terms of cost reduction through audit cost reduction. In addition, regulatory and operational non-compliance ultimately affect financial aspects of a business.
- **Marketing drivers:** concerns the pressure from the customer to implement an IMS and could be measured in terms of sales figures.

- **Social drivers:** refers to pressures from community and employees to carry out practices that are socially acceptable. Indeed, organisations must comply to social norms as this provides a positive image for the organisation.

Almeida (2014) indicates that it was possible to verify that management subsystem integration is assumed an important issue for the performance of HILO organisations, namely in terms of management system efficiency and improvement and in the satisfaction of customers' specific requirements. For the LILO organisations, the management system integration has no significant effect in operational terms. The main benefits perceived by HILO organisations were related to organisational process issues, namely operational improvement due to an organisational culture change. The LILO organisations pointed out benefits mainly in terms of document reduction.

Asif et al. (2009) identified that there many benefits to an IMS. Table 2.7 presents the benefits of an IMS.

Table 2.7: Tabulated benefits of an IMS

Benefits of an IMS		**Supporting literature**
Documentation reduction	Elimination of documentation duplication	Douglas and Glen (2000), McDonald, Mors and Phillips (2003) and Zutshi and Sohal (2005)
Customer's demand	Pre-requisite for business	McDonald et al. (2003)
	Enhanced customer satisfaction	Douglas and Glen (2000)
	Improved customer service	Wiśniewska and Szczepańska (2014)
Operational benefits	Operational improvements	Carvalho et al. (2015)
	Simplified systems and innovation	Douglas and Glen (2000), Zutshi and Sohal (2005), Rebelo et al. (2014)
	Time saving	Zutshi and Sohal (2005)
	Better synergies between systems	Rocha et al. (2007)
	Unification of internal audits	Salomone (2008)
	Unification of training activities	Salomone (2008)
	Common framework for continual improvement	McDonald et al. (2003)
	Overall organisational performance improvement	McDonald et al. (2003) and Simon and Douglas (2013)
Resources allocation and utilisation	Better allocation of resources	Zeng et al. (2007) and Ramphal (2012)
	Saving of human resources	Salomone (2008) and Carvalho et al. (2015)

Benefits of an IMS		Supporting literature
	Better utilisation of resources	Rocha et al. (2007
	Greater acceptance by employees	Zutshi and Sohal (2005)
	Cultural change (Learning organisation)	Wrighta (2000), Zutshi and Sohal (2005)
Other benefits	Strategic planning	Zutshi and Sohal (2005)
	Financial improvements	Carvalho et al. (2015)
	Enhanced interdepartmental communication	Douglas and Glen (2000), Wrighta (2000) and Zutshi and Sohal (2005)
	Better definition of responsibilities	Salomone (2008)
	Means to sustainable development	Fresner and Engelhardt (2004)
	Competitive advantage	Almeida et al. (2014)

Adapted from Asif et al. (2009)

From the benefits of an IMS tabulated above, authors Simon and Douglas (2013) cited the major improvements related to having an IMS include aspects:

- costs savings;
- operational benefits;
- better external image;
- improved customer satisfaction; and
- enhanced employee motivation.

Tarí, Azorín and Heras (2012) explain that the benefits most frequently analysed by researchers with respect to an IMS are:

- improved efficiency;
- improved customer satisfaction;
- improvements in relations with employees; and
- profitability and improved systematisation.

In addition, other benefits cited by Tarí et al. (2012) are an improvement in market share and sales, image, product/service quality and exports. The three benefits least studied are an improvement in competitive position, improved relations with suppliers and improved relations with authorities and other stakeholders. The management of integrating the systems can bring many benefits to the organisation and the employees. It shows as the biggest gains for the organisation as synergy in execution of common tasks, cost reduction, improving the organisation image, bureaucracy reduction, and reducing the duplication of tasks.

Dordević et al. (2010) indicate that implementation of IMS concepts provides certain benefits to organisations, which include:

- encouraging management,
- enabling a comparative advantage,
- attracting investments,
- improving and protecting brand reputation,
- increasing stakeholders' attention and satisfaction,
- avoiding duplicating instructions and efforts causing confusion,
- providing the best practice and lessons that offer knowledge within all disciplines (safety, environment, quality),
- there is one annual programme of internal audit that reduces hampering the internal management; however, care should be taken that the audit includes a representative sample of the IMS of the organisation,
- ensuring development of an individual set of requirements, thus reducing the documentation system to the minimum,
- training carried out in an integral system reduces its duration (if single elements of the system are separated, this might result in doubling the process of training).

Carvalho et al. (2015) worked on the benefits and challenges of integrating management systems. They used a questionnaire which was sent to 176 organisations in Catalonia, Spain. They reported several benefits in integrating e.g. an increase in employee motivation, better collaboration, an increase in organisational efficiency, an increase in organisational culture, improvement of the organisational strategy, communication, and organisation image, and also better use of the results of the internal and external audits.

Research conducted on small medium micro enterprises (SMMEs) by Stamou (2003) found that the absence of time seems to be the most important hurdle that small and medium businesses encounter in order to adopt an IMS. To get experienced staff to integrate the systems were also a concern. A holistic management allows organisations to share the human, material, informational, infrastructural and financial resources pool (Karapetrovic & Jonker, 2003). This leads to enhancing common synergies within different standards (Crowder, 2013; Renzi & Cappelli, 2000) and improving organisational efficiency and profitability (Abrahamsson et al., 2010). This type of management promotes an effective management model that can be integrated with other management requirements from the point of view of organisations' top management (Waclawovsky & Batiz, 2010), and also a sustainability warranty (Kuei & Lu, 2013).

After a critical analysis of the literature on this topic, it can be argued that the benefits can be grouped into two categories: internal benefits and external benefits (Olaru et al., 2014:694), as reflected in Table 2.8 and Table 2.9 below.

Table 2.8: Internal benefits

Table of internal benefits
• Improvement of internal efficiency and effectiveness.
• Homogeneity in management methodologies.
• Avoiding duplications between procedures of the systems.
• Reducing paperwork in the organisation.
• Eliminate the overlap of effort amongst employees.

Source: Olaru et al. (2014)

Table 2.9: External benefits

Table of internal benefits
• Increase in profit margins.
• Increase in operational efficiency by harmonising organisational structures with similar elements and sharing information across traditional organisational boundaries.
• Harmonisation of MS documentation.
• Enhanced customer confidence.

Source: Olaru et al. (2014)

In Table 2.10, the author illustrates there are several interested listed parties and associated needs and expectations to be satisfied by organisations according to the requirements of related MSs. The increasing global competition potentiates an increase in the expectations of all the interested parties of organisations.

Table 2.10: Beneficiaries of integrated management systems

Interested parties	Needs and expectations
Customers	Quality, price, delivery, performance of products
Owners/shareholders	Sustained profitability, transparency
People in the organisation	Good work environment, job security, recognition and reward
Suppliers and partners	Mutual benefits and continuity
Society	Environmental protection, ethical behaviour, compliance with statutory and regulatory requirements
Competitors	Ethical behaviour, fair competition, zero ethical faults
Government, labour unions, regulators	Attractive employer, business continuity, compliance with statutory and regulatory requirements, energy efficiency, mutual benefits, on-time payment of taxes and others fees, risk management, sustained profitability, transparency

Source: Adapted from Rebelo et al. (2014)

So, more than ever, business sustainability gains increased importance and the focus is shifting away from their financial results.

2.9.6 Challenges associated with an IMS

A difficulty in the IMS implementation process may occur due to insufficient integration of the staff in the development of an IMS. Further introduction shown through the examination of unaccepted and opaque management systems, which are rarely developed for a particular organisation. If the organisation wants to introduce an integrated system, it will face some challenges such as the following (Dordević et al., 2010).

- The issue of methodology used to introduce an integrated system with a dilemma, such as whether to take one or several consultants for the subsystems. However, there is a danger of forming parallel systems, as each consultant might have his or her own vision of the system and his or her own perception of the system requirements.
- Concern about excessive documentation that will choke the integrated system with a risk of having a documented system that is not applied or cannot be applied failing the acceptance of a positive business practice.
- The issue of whether the requirements of standards themselves will be incorporated in the integrated system. There is a risk of wandering to some type of management without having much touch with management standards, making certification of such a system impossible.
- Concern over imposing uniformity of integrated systems, as well as uniformity of documentation itself.

Regarding the major difficulties to integrate all systems, Vitoreli and Carpinetti (2013) report that a shortage of human resources for deployment, a lack of collaboration between departments, a lack of specialised auditors, a lack of motivation and different models of each standard are the challenges associated with an IMS. Simon, Karapetrovic and Casadesús (2012a) also emphasise the lack of collaboration between departments as a difficulty in integrating systems. Simon et al. (2012a) indicates that the lack of employee motivation appears as the main difficulty in integrating systems.

Despite the previous mentioned benefits, some authors state that the implementation of multiple management systems may hinder innovation (Castillo-Rojas, Casadesús, Karapetrovic, Coromina, Heras & Martın, 2012).

Further challenges were revealed by Carvalho et al. (2015). In Table 2.11 the author scrutinises the integration of IMS documentation.

Table 2.11: Overview of analysed documents of integration

Policies	**Nonconformities**
Management manual	Internal and external audit
Internal communication	Training
Objectives and goals	Operational procedures
Resources and provisions	Responsibilities
Preventive and corrective actions	Critical analyses

Source: Carvalho et al. (2015) (2015)

In addition, Patience (2008) indicates that the IMS requires some changes in the organisation, such as focus on products, stakeholder collaboration and the creation of a learning environment, which might lead to some factors that might hinder integration of management systems, which include:

- the absence of knowledge amongst employees and the management, absence of demands; and
- both internal and external risks involved in replacing existing bureaucracy.

Almeida et al. (2014) found the following difficulties when implementing an IMS between high integration level organisations (HILO) and low integration level organisation (LILO).

Table 2.12: Difficulties when implementing an IMS

	Organisation	Difficulties
HILO	A	Behaviour and procedures change by some employees, mostly those who were in the organisation for more time Organisation restructuration
	B	Lack of experience of the consulting organisation in management system integration Changes in the organisation structure
LILO	C	Did not feel significant obstacles until this moment, since they only integrated documentation, keeping the subsystems separated.
	D	Lack of local consultants Lack of partners with IMS for benchmarking effects Financial investment.

Table 2.12 was extracted from Almeida et al. (2014) and indicates that, during the management subsystem integration, HILO organisations faced difficulties. These difficulties, also identified by authors such as Sampaio et al. (2008) and Simon, Karapetrovic and Casadesús (2012), occurred mainly at the internal restructuring level and employees' behaviour change. LILO organisations did not indicate obstacles, as they only performed documental integration (Almeida et al., 2014).

Bernardo, Casadesús and Karapetrovic (2011), in their research of a sample of 362 organisations who were registered at least to both ISO 9001 (2000) and ISO 14001 (2004), were examined regarding the difficulties of implementation of an IMS. The variables included in the study are summarised in Table 2.13.

Table 2.13: An evaluation of a set of difficulties encountered during the process of integration

Difficulties	Main authors
Lack of integration guidelines	Karapetrovic et al. (2006) and Zutshi and Sohal (2005)
Lack of government support	Karapetrovic et al. (2006), Zeng et al. (2007) and Zutshi and Sohal (2005)
Lack of human resources	Asif, Bruijn, Fisscher, Searcy and Steenhuis (2009), Karapetrovic et al. (2006) and Zutshi and Sohal (2005)
Different models of standards	Karapetrovic and Willborn (1998a), Karapetrovic et al. (2006), McDonald et al. (2003), and Salomone (2008)
Differences in common elements	Asif et al. (2009), Beckmerhagen et al. (2003), Karapetrovic and Willborn (1998), Karapetrovic et al. (2006), Matias and Coelho (2002), Zeng et al. (2007) and Zutshi and Sohal (2005)
Lack of departments' collaboration	Asif et al. (2009), Karapetrovic et al. (2006) and Zutshi and Sohal (2005)
Lack of specialised auditors	Karapetrovic et al. (2006), Kraus and Grosskopf (2008) and Zutshi and Sohal (2005)
Lack of technology support	Karapetrovic et al. (2006)

Difficulties	Main authors
Lack of consultants	Karapetrovic et al. (2006) and Zutshi and Sohal (2005)
Inadequate first implementation	Karapetrovic et al. (2006)
Lack of time for integration	Karapetrovic et al. (2006), Salomone (2008), Wilkinson and Dale (2000), Zeng et al. (2007) and Zutshi and Sohal (2005), (2006)
Lack of employees' motivation	Asif et al. (2009), Beckmerhagen et al. (2003), Karapetrovic et al. (2006), Matias and Coelho (2002), Zeng et al. (2007) and Zutshi and Sohal (2005),

Source: Bernardo, Casadesús and Karapetrovic (2011)

The first group consisted of 246 organisations that have implemented two management system standards (MSs). The second group comprised 82 organisations with three MSs implemented. The first conclusion was that the difficulties of integration can be grouped in three large clusters, namely 'internal difficulties', 'external difficulties' and 'difficulties with the standards' (Bernardo et al., 2011). The second conclusion related to the integration difficulties, is the low importance participating organisations give to these difficulties, with the least valued ones being the inadequate implementation of the first management system (Asif et al., 2009; Zeng et al., 2007) and lack of time for integration (Asif et al., 2009). The most valued are the "differences between the models underpinning the standards" (Beckmerhagen et al., 2003; Karapetrovic, 2003; Karapetrovic & Willborn, 1998b; McDonald et al., 2003; Salomone, 2008) and the lack of support from government. The final conclusion concerns the clustering pertaining to the IMS. A high level of integration was found in both groups (similar to Bernardo et al., 2009), but the first group presented higher levels than the second group, meaning that more MSs implemented could reduce the level of integration.

Summarising the difficulties for those organisations with two MSs implemented, and which were willing to integrate them, but have not initiated the process, the results of these studies presented show that the integration of management systems will not be a problem. In contrast, the organisations with three MSs may face difficulties during the integration process. If organisations are aware of the integration difficulties, they will face the integration process more prepared and the probability of finishing the process successfully will increase. Training the personnel could help in this challenge. This can make organisations more efficient and competitive.

2.9.7 Studies of IMSs

The IMS was studied by many authors, as follows:

- Degrees of integration: McDonald et al. (2003) and Bernardo et al. (2009) provided a summary of the degrees of integration.
- According to the ISO guide (2001), the experience with MSSs issued by ISO shows that there exists a number of common elements, which can be arranged under the following main subjects, as stated by Santos et al. (2011):
  - policy;
  - planning;
  - implementation and operation;
  - performance assessment; and
  - improvement and management review.

On the other hand, Karapetrovic and Casadesús (2009) state that there are many organisations that implement different MSs, either as a result of market demand or for internal reasons, despite having their origins in different aspects of an organisation's performance.

Table 2.14: Main aspects of an IMS

Integration aspect	Definition	Main characteristics	Studies
Methodology	Models or tools used in the process	National standards are available to support integration. Academic authors	AENOR (2005), BSI (2012), ISO (2008). Karapetrovic and Willborn (1998a), Zeng et al. (2007), Asif et al. (2009), Tari and Molina-Azorín (2010).
Level	Degree of integration achieved by the IMS	No integration (MSs are managed separately). Partial integration (some components of the MSs are integrated). Full integration (all components of the MSs are integrated.	Wilkinson and Dale (1999), Karapetrovic (2003), Beckmerhagen et al. (2003), Karapetrovic et al. (2006), Bernardo et al. (2009).
Audits' systems	Integration level of internal and external audits	Higher level of integration in internal audits than in external audits.	Karapetrovic and Willborn (1998), Bernardo et al. (2009), Simon et al. (2012a).

Source: Bernado et al. (2015)

According to Santos et al. (2011), the key integration technique used by the Portuguese small and medium organisations (SMEs) for the building of the system is the arrangement of the

separate systems using the alignment between the MSSs. This alignment is aimed at reducing administration and audit costs.

Furthermore, Bernardo et al. (2009) argue that the best way to start the integration of MSs is to identify mutual areas in the various standards and to ensure that the greatest possible number of procedures is shared among different MSs. Or, in other words, attempts should be made to adapt and integrate the maximum number of procedures into the various systems, that is, combined management procedures.

However, Beckmerhagen et al. (2003) point out that “the management systems implemented separately in an incompatible way result in costs, an increased probability of faults and errors, duplicated efforts, the creation of unnecessary bureaucracy and a negative effect near the stakeholders, particularly employees and customers”.

According to Salomone (2008), a cultural shift is underway and the number of organisations with more than one certification is constantly on the increase. Many of them are advancing towards integration.

Almeida et al. (2014) found the following integration levels as represented in Table 2.15.

Table 2.15: Integration levels in organisations

Organisation group	Organisation	Number of integration levels identified	Features
HILO	A	4	Systems find themselves well integrated. However, there are improvements to be made. Identified levels: 1 – Policy 2 – Documentation support 3 – Objectives and goals 4 – Operational control/management tools
	B	4	Even having the notion that it can be improved, a maximum level integration was considered. It was also considered that it was still in a growing stage where the integration with other management subsystems will be easier. Identified levels: 1 – Policy 2 – Documentation support 3 – Objectives and goals 4 – Operational control/management tools
LILO	C	2	Integration only at the documental level. As far as operational control is concerned, there is still an independent approach, at the quality, environment and safety level Identified levels: 1 – Documentation 2 – Policy and objectives
	D	1	Only integrated at documental level Identified level: 1 – Documental integration

2.9.8 IMS characteristics

An IMS is a single management system that delivers the processes of the business through jointly supporting and structured management functions organised around the broader needs of the organisation (Griffith, 2000).

Established at strategic management level within an organisation, an IMS involves the development of a framework within which the organisation operates in relation to its business activities and its environment designs the management procedures describing the actions to be taken in key areas of organisational activity, develops the work instructions to guide

operations and tasks, and, where appropriate, situation-specific plans to describe the provision of products and services in differing circumstances (Griffith, 2000).

An IMS pursues to attain superior organisational and business efficacy through reorganisation actions and facilitation of the challenges frequently related with single management systems (Griffith & Bhutto, 2009).

According to Griffith and Bhutto (2009), an IMS is based on following eight core management principles (values):

- customer satisfaction;
- leadership commitment;
- total participation of employees, education and training;
- facts-based decision-making;
- continuous improvement;
- employees' health and safety;
- realisation of social responsibilities; and
- sustainable development.

The research by Dordević et al. (2010) regarding SMEs established that transition countries may benefit significantly from the implementation of an IMS in their organisations. In that way, these SMEs will advance their effectiveness on the global market in the following ways namely:

- Greater involvement of business services in informing entrepreneurs about the appropriateness of IMS implementation in their organisations.
- Through enactment of positive statutory regulations such as the National Quality Strategy (see Dordević et al., 2010).
- A more powerful entrepreneurs' initiative oriented towards introduction of quality management system (QMS) in SMEs (through established guilds, clusters and other types of SME associating).
- Education of SME owners, as the most responsible people for successful implementation of QMS, is a must for business services in the process of creating a favourable atmosphere (e.g., entrepreneurs are not aware of advantages of implementing QMS in SMEs).

2.9.9 A summary and analysis of the studies on IMSs

First, in procedural terms, the literature on IMSs identified several ways to implement an integrated management system.

- **In addition**, when there is already a management system within the organisation, which is usually the quality management system. In this case, other processes necessary for the new system to be implemented, for example the environmental management system, are added to the existing system.
- **By merging**, when there are two or more independent management or operational systems within the organisation. It is the unification of procedures that describe the same decision process, but from different perspectives, into a single procedure, to include all requirements of all relevant standards.
- **By integration** from the very beginning, when there is no management system implemented in the organisation and it is decided to develop an integrated management system that meets several standards.

The need for the integration of individual MSs is entrenched in the need to utilise organisational resources effectively (Asif, Searcy, Zutshi & Fisscher, 2013). Thus, the integration of operations, quality, strategy and technology is increasingly seen as a way to sustain the competitive advantage of organisations, as well as a way to overcome the challenges associated with programmes and quality standards.

Secondly, implementing several standards simultaneously and independently can be costly and demanding on human resources. Integrating the standards has been shown to be a means of overcoming these difficulties. Significant research opportunity exists to develop a standard that identifies distinct conceptual categories of IMS motivation, corresponding antecedents and outcomes associated with each motivation, and factors that influence IMS implementation (Carvalho et al., 2015; Rebelo et al., 2014).

Thirdly, most of these are empirical studies (Douglas & Glen, 2000; Jorgensen, 2008; Wisniewska & Szczepańska, 2014) which focus on integration benefits and approaches only, while others focus on test models (such as Wilkinson & Dale, 2000), but do not focus on factors and their inter-relationships effecting IMS implementation. Also, these studies are carried out in economically developed countries, but not in any developing country.

Finally, the integration and unification of the three (or more) MSs will be the future in organisations. Therefore, for this to happen, it is important to ensure that there is a structured manner in which an IMS implemented.

2.10 THE NATURE OF LEADERSHIP

'Leadership is the most powerful force on earth' (Mintzberg, 1973).

The concept of leadership is complex. A review of the literature highlights the large body of research on leadership and the multitude of definitions of the concept itself (Van Niekerk, 2012).

2.10.1 Leadership and stakeholder relationships

"Management is doing things right; leadership is doing the right things" (Drucker, 1998)

There are three theories of neo-charismatic leadership: charismatic, transformational and African (Du Toit, Erasmus & Strydom, 2010).

The behavioural approach to leadership was conducted by two namely:

- Researchers at the University of Iowa have identified the following leadership styles – autocratic; democratic (the style of leaders which involves employees in decision-making, delegates authority, encourages participation in deciding work methods and goals, who gives feedback) was the most effective style; laissez faire, whereby leaders left all the decisions to their employees and do not follow up, was ineffective in every performance criterion when compared to the other two styles.
- Meanwhile, researchers at Ohio State University identified two leadership styles, namely initiating (this is the way a leader defines and structures his or her role and the roles of employees) and consideration (this is the extent to which a leader has the job relationship characterised by mutual trust, respect for employees' ideas and regard for their feelings).

The research conducted by University of Iowa and University of Ohio is in line with the behavioural approach to leadership, in that successful leaders behave differently from unsuccessful leaders.

Benson (2016) indicates that every action, every decision, every reaction, every plan should be filtered through your philosophy. Your philosophy becomes your compass. It keeps you on track. It becomes your true north.

Leadership is not the same as management. A popular contemporary definition of leadership from the managerial point of view describes it as the processes of influencing employees to work willing toward the achievement of organisational objectives (Du Toit et al., 2010).

Therefore, the leaders of an organisation should have insight into their employees' experiences and the environment in which they work to ensure that there is alignment between the required organisational climate and organisational objectives. Consequently, managers need to conduct regular climate surveys to examine their employees' perceptions of the climate and take the necessary measures to correct any misperceptions. Alternatively, they may target organisational areas for improvement, like the 2012 International Labour Organisation Report on global employment trends highlighted, or specific dimensions that Castro and Martins (2010) emphasised.

Leadership may be described in a variety of ways, such as transformational, transactional, charismatic or autocratic, participative, democratic, or laissez faire. Regardless of leadership type, all leaders have one common denominator: followers. Contingency theory (see Fielders, Chemers & Mahar, 1977) provides some direction on leadership approaches.

2.10.2 Contingency theory approach to leadership

Fielders (1978) theory of leadership proposes that effective group performance depends on the proper match between a leader's style of interaction with employees, and the degrees to which the situation gives control to and influences the leader.

Hersey and Blanchward's (1969) situational leadership model says that the work maturity of employees determines the best leadership style for a particular situation. Work maturity is determined by the employees' need for achievement and willingness to accept responsibility.

Robert House (1971) developed the path goal model. It is the leader's responsibility to help employees achieve their goals.

Honeybee leadership approach. More recently, the concept of Honeybee leadership, referring to a resilient and humanistic approach to corporate sustainability which builds on the sustainable Rhineland leadership practices (see Avery & Bergsteiner, 2011a). Furthermore, Avery and Bergsteiner (2011b) present an evidence-based view of how 23 leadership practices/elements that interact to create Honeybee leadership facilitate outcomes that go beyond the triple bottom line consisting of environmental sustainability, corporate social responsibility and financial success. The 23 practices/elements form three categories: foundation practices, higher-level practices, and key performance drivers.

A contingency or situational approach to leadership acknowledges that predicting leadership success is more complex than examining the traits and behaviour of successful leaders.

2.10.3 Leadership dimensions

The five components of leadership according to Du Toit et al. (2010) are:

- **authority**: the right of a manager to give commands to, and demand actions from employees;
- **power**: this is a manager's ability to influence his or her employees' behaviour;
- **responsibility**: this is the obligation to achieve organisational goals by performing required activities;
- **delegation**: this is the process of assigning responsibility and authority for achieving organisational goals; and
- **accountability**: this is the evaluation of how well individuals meet their responsibilities.

Consequently, the effect of the five components is that managers cannot be effective leaders if their employees do not perceive them as being trustworthy.

2.10.4 The African leadership approach

According to Eustace and Martins (2014), the African approach builds on participation, duty and spiritual authority. It requires transparency, accountability and legitimacy. Leaders are role models who demonstrate personal commitment to the values and goals their organisations have set. They have the ability to create a compelling vision and achieve the enthusiasm and personal commitment of groups.

According to Eustace and Martins (2014), the African leadership approach has six fundamental values:

- respect for the dignity of others;
- group solidarity (an injury to one is an injury to all);
- teamwork is greater than the efforts of the individual;
- service to others in the spirit of peace and harmony;
- interdependence and connectedness; and
- persuasion.

Furthermore, leadership also plays a key role through the processes of sense making, by ascribing meaning to strategy-relevant events, threats and opportunities. To be an effective top leadership team, its managers and employees must share common beliefs and aspirations about the organisation and its future direction.

2.10.5 Ubuntu

The concept of ubuntu in African leadership is pivotal because it emphasises the collective brotherhood of humankind. The interdependence of humanity characterises this concept. It emphasises human dignity and respect and allows for consensus, democracy, people mobilisation, solidarity and genuine care (Eustace & Martins, 2014). One criticism of African leadership is that there is still insufficient empirical research to support it. However, the fact remains that this leadership approach has significant relevance for African countries, including South Africa.

2.10.6 Contemporary issues in leadership

Du Toit et al. (2010) indicate that in a worldwide business environment often rocked by scandals involving business leaders who have acted in dishonest ways and betrayed their organisations, trust is becoming a vital component of effective leadership.

Leaders have a key role in strategy formulation and implementation (Bourne, 2008). In order to achieve this, leaders must be actively and visibly being engaged in their organisations, displaying transformational leadership. This type of leadership is when the leaders' effect on followers in that the followers feel trust, loyalty, and admiration for their leaders and are motivated to do more than is expected of them. Nelson Mandela is an example of a transformational leader who fought for an ideal in which he believed. Managers cannot be effective leaders if their employees do not see them as trustworthy. The five dimensions of trust are the following (Du Toit et al., 2010):

- integrity – a manager's honesty and trustfulness;
- competence – a manager's technical and interpersonal knowledge and skill;
- consistency – a manager's reliability, predictability and good judgement in handling situations;
- loyalty – a manager's willingness to protect another person; and
- openness – one can rely on a manger to tell the whole truth.

To be an effective top leadership team, its members must share common beliefs and aspirations about the organisation and its future direction.

2.10.7 Three leadership ineffectiveness traits

Pienaar (2009) refers to leadership ineffectiveness as those observable and unobservable behaviours and, by implication, personal qualities and character of leaders that make them ineffective.

According to Burke (2006), there are certain themes emerging from the literature focusing on leadership ineffectiveness.

- **First theme of ineffective leaders**

The first theme is associated with the inability of a leader to develop effective interpersonal relationships due to a lack of interpersonal skills. The leader may be arrogant, stubborn, and/or egocentric. Also, specific problems include abrasive behaviour towards others. Leaders with these problems have also been found to lack the ability to balance and maintain interpersonal relationships with a variety of constituencies simultaneously. Problems related to interpersonal relationships include the inability to build a team, difficulty in moulding and shaping employees into a team, and difficulty in resolving conflict among team members. The importance of interpersonal skills is further emphasised by Crosbie (2005) who refers to research conducted by Harvard University, the Carnegie Foundation and the Stanford Research Institute. It was found that technical skills and knowledge account for about 15% of the reasons why an individual finds, keeps and advances in a job. The remaining 85% of job success is based on a person's people skills.

- **Second theme of ineffective leaders**

The second theme suggested by Burke (2006) revolves around leaders who are afraid to take risks and make errors. These leaders are cautious and avoid responsibility.

- **Third theme of ineffective leaders**

Finally, scepticism and distrust as cited by (Burke, 2006) reduce a leader's effectiveness even more, especially when it comes to motivating others. These leaders are cynical and untrustworthy.

The character of a leader and the ability to manage one's own emotions; and difficulty in effectively managing interpersonal relationships may be some of the major aspects having a negative influence on the effectiveness of a leader.

2.10.8 Leadership styles

An executive usually makes his or her decisions under the pressure of a time constraint. There is rarely time enough to analyse each matter thoroughly before the leader must make a decision (Roberts & Handline, 1975). According to Chou, Lin, Chang and Chuang (2013), several taxonomies for classifying leaders by style have been proposed in the literature. Among these, the transformational leadership and transactional leadership styles has been of the most-cited theories of leadership.

Transformational leadership is defined as the one that creates respected and encouraging changes in its followers. Transformational leadership is highly effective in terms of subordinates' development and performance. Transactional leadership will allow communication to employees and from employees (top down and bottom up approaches).

Roberts and Handline (1975) say that in classical management theory, the main emphasis is put on 'the work' necessary to achieve an organisation's goals. Matters requiring decisions are recognised in two ways in this theory. First, they are recognised through the planning and control functions of management as these relate to current operations. Planning defines goals and standards, and the control function compares operational performance to standards. If there is a significant variance between actual performance and the standard for acceptable performance, this would signal that a decision, or a series of decisions, is required to bring performance back to standard. Roberts and Handline (1975) argue that the strategic plans of an organisation are prepared to direct it toward or adapt it to its future environment-forecast. If a comparison of the organisation's present course with its indicated future course reveals significant differences, these differences suggest forthcoming opportunities or difficulties. Decisions are then required so that the organisation can act appropriately.

The executives must use a small, but important, portion of their time to decide which problems and decisions to put aside for a while, since those do not require an immediate decision. This accomplished, the executives must then decide which problems should take first priority for their time and attention.

2.10.9 Stakeholder theory

According to stakeholder theory, organisations must take into account the interests and expectations of their various stakeholders, defined as any identifiable group or individual who can affect the achievement of an organisation's objectives, or who is affected by the achievement of an organisation's objectives" (Freeman & Reed 1983). According to this theory, organisations are not only accountable to their shareholders but to their stakeholders as well.

They must also take into account the needs of various groups or individuals who have a direct or indirect stake in their activities: employees, customers, government agencies, NGOs, suppliers, and the media (e.g. Donaldson & Preston, 1995; Jones, 1995). Some studies have focused on specific case studies, describing the process of stakeholder participation in areas such as ecotourism (Fletcher, 2009).

According to Maryska and Sladek (2017), an organisation management is responsible to stakeholders and is responsible for all activities and actions that are realised in an organisation. According to Wiengarten, Lo and Lam (2015), in recent years we have seen a significant increase in stakeholder pressure on firms to be not only economically sustainable but also from an environmental and social perspective. Besides operational changes in practices and products organisations have reacted toward this increased pressure from a strategic perspective. According to Burita and Zeman (2017), stakeholders in business and information technology (IT) organisations are faced with challenges that result from technological changes occurring at accelerated paces, economic and environmental issues demanding immediate actions, and a need for more precise collaborative decision-making.

Boiral and Heras-Saizarbitoria (2015) aver that, although stakeholder involvement is often essential to the management of biodiversity, very few studies in the literature have focused on the details of this involvement. Wagner (2014) combining stakeholder resource-based and institutional theories suggests that stakeholder demands affect the environmental and social activities of firms, which in turn influence various performance aspects. Organisations that manage for stakeholders by allocating more resources to meet expectations and requirements of stakeholders develop fair and just relationships (Freeman Harrison, Wicks, Parmar & DeColle, 2013). Ultimately, this enables firms better to concentrate on stakeholder interests and relationships rather than market transactions and therefore also to contribute to joint value creation (Freeman, Harrison & Wicks, 2007). Rydhagen and Dackman (2011) indicate that stakeholders need to be involved early in the different processes of planning and decision-making in order to achieve changes. Complexity theory clarifies that one cannot change just a single element or process within a complex system, because all of the other unchanged elements and processes in the system will respond to the change in unpredictable ways and often provoke that the changed element and process realign itself with the rest of the (unchanged) system, or trigger an unexpected effect resulting in paralysis or even chaos (Ogilvy, 2013). This principle explains, for example, why so many of the transformations of the Dutch educational system failed. The Dutch ministry forgot to apply the golden rules of implementing change in complex environments: get everybody involved, including the students and their parents.

Therefore, stakeholder management is an important factor when integrating management systems as both the internal (employees) and external (customers and those groups who have an effect on the organisations) objectives must be consulted when making decisions. This process of engagement will allow for fair and just relationships.

2.10.10 Summary of leadership and stakeholder relations

The history of theory development was presented through organisation and management theories and models from the early 1800s until today (Donaldson & Preston, 1995). A suggested model that the evidence-based approach to organisation theory development may be more appropriate in today's dynamic environment of rapid change. Finally, the research provides related theories that were developed using the evidence-based approach to organisation theory development.

To conclude this section, regarding the IMS, there is not necessarily a single correct approach each organisation should determine what is appropriate for them. This means that the importance of an IMS and the levels of an IMS cannot be overemphasised, because its significance is obvious. As more and more organisations come to realise this, the more they integrate their management systems.

2.11 MANAGEMENT

'The manager is a reflective, systematic planner' (Mintzberg, 1973).

2.11.1 Behavioural theory of management

For Roberts and Handline (1975), the behavioural theory of management enhances the list of matters invoking decisions and situations that appear when an organisation is engaged in organisation development and considers social processes and cultural and other values of the organisation. Generally, these decision matters are of an immediate nature, but long-run consequences may also be important. The human being and his or her values and the compatibility of organisational processes are aspects of an organisation that the behaviourist investigates to determine whether decisions regarding organisational matters are required.

2.11.2 Systems theory of management

Roberts and Handline (1975) argue that the systems theory of management emphasises the interdependence of all parts of a defined system. The recognition that an organisation is a complex system of varied elements increases the number, the type of, and the need for

decisions; more so, in fact, than work- and goal-oriented or person-oriented approaches. The recognition of the interdependence of the constituent parts of a defined system inherently requires that an increased number of internal and external forces and factors be considered in making decisions. Prominent among these factors is the organisational environment. Every organisation exists in a system, of which it is only a part.

2.11.3 Decision theory related to management

According to Roberts and Handline (1975), decision theory itself provides a discrete approach to each decision, although it recognises the implications that a prior decision has for a present one. It recognises, also, that a sequence of decisions may be necessary to solve a problem. In other words, that more than one decision may be required to solve a particular problem. Nonetheless, decision theory does not indicate how precedence is to be established for either discrete decisions or a related series. Therefore, a theory of decision-making needs to be complemented by the development of a direct approach to the setting of decision-making priorities and schedules. Theories of organisation and management deal with the recognition of decision situations, but offer little help to an executive in scheduling decisions. However, using intuition, logic, and mathematics, the executive can approximate the gain potential of each decision situation. He or she can then use these approximations to establish priorities for decision-making. This decision-making schedule will increase the executive's effectiveness and maximise benefits to his or her organisation.

Guadalupe, Li and Wulf (2014) highlight that the executive team is a reflection of a firm's organisational structure, as well as the governing body that sets firm strategy, coordinates activities, and allocates resources across business units. An organisation's strategic decisions and directions are typically made by its chief executive officer (CEO) and its additional members of the top management team. The top management team can be defined as a relatively small group of executives at the strategic apex of the corporation with overall responsibilities for the entire organisation (Strand, 2013).

In addition, Huy (2011) points out that because middle managers occupy leadership positions, their emotions can influence many of their subordinates' emotions, thinking, and behaviour, all of which can influence strategy implementation. Consequently, managers need to conduct regular climate surveys to examine their employees' perceptions of the climate and take the necessary measures to correct any misperceptions. Alternatively, they may target organisational areas for improvement, like those that the 2012 International Labour Organisation *Report on global employment trends* highlighted (Castro & Martins, 2010).

In Figure 2.8 the author indicates that to manage is to make decisions and allocate resources, including human resources. In the dynamic and the fast-changing business environment of the 21st century, organisations need managers who are also strong leaders and vice versa.

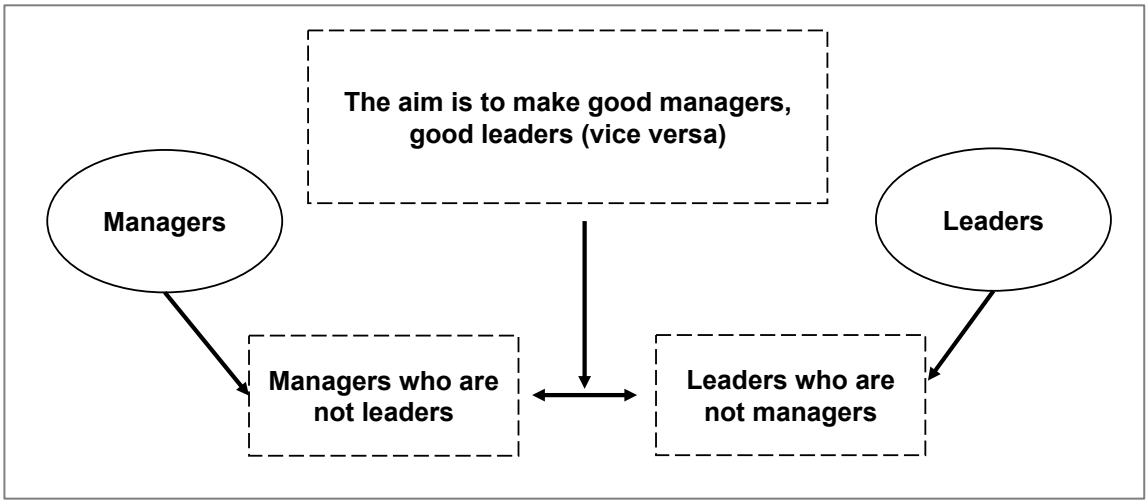

Figure 2.8: Integration of leadership and management

Source: Du Toit et al. (2010)

Managing therefore means analysing, and often calculating, based on facts from reports. In fact, the task of management is to formulate strategies based on the resources and capabilities of the firm and match them with identifiable opportunities in the external environment by selective market entry.

Blake and Mouton (1978) developed the Managerial Grid, an instrument that identifies various leadership styles on a two-dimensional grid. They developed the ideal leadership style as the team management style where a manager is strong on both dimensions. However, the behaviour theories in general had little success in identifying consistent patterns of leadership behaviour and successful performance because results varied over diverse range of circumstances (Du Toit et al., 2010).

In much the same way, by adopting a coherent bundle of organisational attributes, management generates momentum towards increased exploration. Du Toit et al. (2010) identified that managers at all levels are strong leaders if they can convey their vision of their section or department. Nonetheless, each tack or shift in structure imposes costs on the organisation, including lost momentum which curtails performance. Once efficiency is achieved, a key task of the manager is to identify when changes in the formal organisation are required and what these changes entail.

2.11.4 Types of management

Ackoff differentiates between four types of management. He distinguished the first three based on their behaviour towards time and change (Ackoff, 1999a)

- Reactive management: The reactive approach to a problem is to identify the cause and try to remove, suppress or solve it. After the problem is solved, the system returns to the state it was before the problem arose.
- Inactive management: Inactive managers are satisfied with the way things are. They don't want a change, and therefore will only repair the damage. Therefore, they believe that if things are not broken, leave them alone.
- Proactive or preactive management: Proactive managers think change is an opportunity to be exploited so they welcome the opportunity. They always think the future could be better than today, even if the present is good. Proactive managers attempt to predict and prepare for the future, and therefore establish visions and objectives.
- Interactive management: This consists of bringing the problems under control considering that the results are due to the consequences of the activities of the organisation. Interactive management must be continuous and can begin with any of these six phases: analysis of the situation, ends planning (visions, objectives and goals), means planning (policies, programmes and projects), resource planning, implementation and control.

Interactive planning is therefore a kind of proactive planning in which you work from the ends to the means. The scientific and the multilevel synergetic approaches to management are examples of proactive and interactive management.

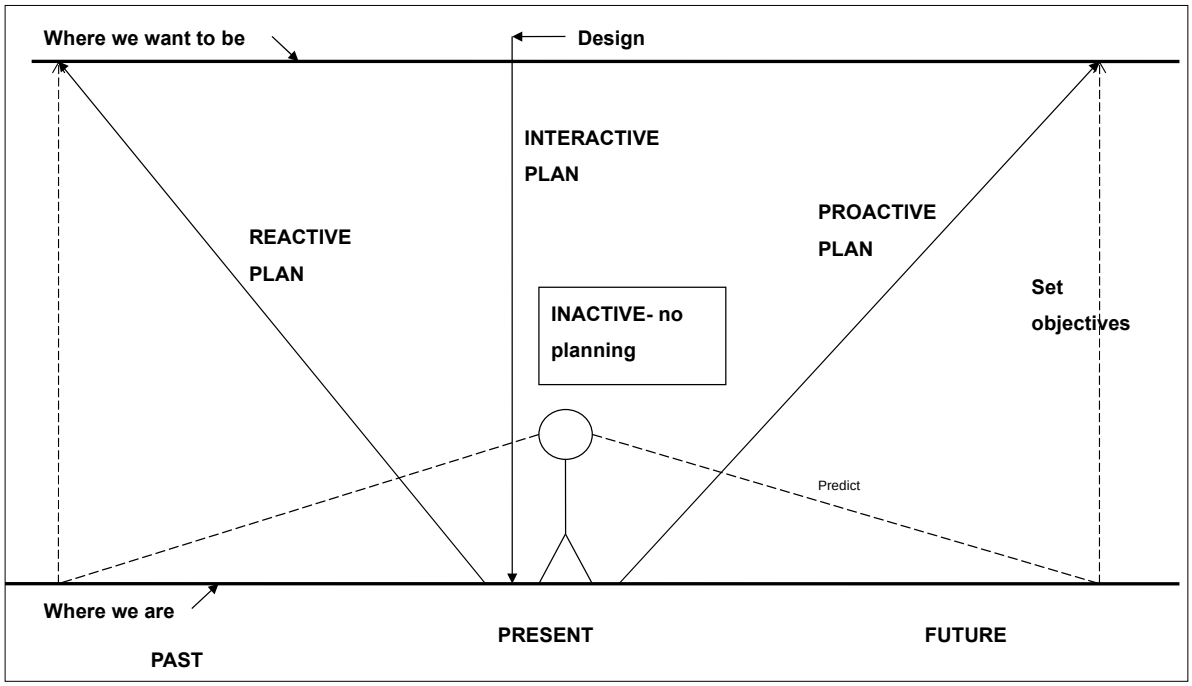

Figure 2.9: The different approaches to management

Source: Ackoff (1999a)

In Figure 2.9, inactive management is not well represented. The line where we are being the line where we want to be.

Wilkinson and Dale (2001) refer to this as integration in a system concept where integration and alignment increases efficiency and effectiveness as the subsystems lose their dependence. Therefore, proactive and interactive management will lead to higher levels of the IMS compared to reactive and inactive management. This is because the elements of the different management systems will easily be integrated and the subsystems will be quickly lost to form an IMS in proactive and reactive management. However, proactive management can lead to the first two levels of the IMS and interactive management will lead to the third level of the IMS as proactive management is more ambitious than interactive management.

2.11.5 Managerial implications

Building and maintaining quality relationships between employees and managers would improve the organisational climate further (Eustace & Martins, 2014).

The dimensions that Castro and Martins (20101) propose are the leadership of the immediate managers, transformation and diversity, personal growth and development, interpersonal belonging and fit, general feeling of job satisfaction, employee wellness, image, pay, challenging and interesting work, physical work environment, recognition and

acknowledgement. These dimensions generally reflect the dimensions, specifically those that reflect leadership. The following factors are a generic list of requirements and not limited to Castro and Martins (2010).

2.11.6 Top management support

Top management support has been highlighted as an important contingency factor in supporting various management practices (Baird, 2009). Therefore, organisations' leaders should have insight into their employees' experiences and the environment in which they work to ensure that there is alignment between the required organisational climate and organisational objectives.

2.11.7 Training and learning in an organisation

Organisational learning (OL) is a valuable approach to understanding employees. OL occurs when an organisation acquires or creates knowledge, develops new ways of thinking, and modifies its behaviour to reflect new knowledge and insights (Argyris & Schoen, 1978; Huber 2011). OL contains two broad types of learning processes, one aimed at doing a better job of matching outcomes of organisational actions with intentions (e.g. by correcting ineffective activities ('single-loop learning') and the other aimed at improving an organisation's knowledge (e.g. by questioning and updating norms, practices, and underlying assumptions and beliefs hitherto accepted in the organisation, 'double-loop learning' (Huber, 2011).

The provision of training resources indicates that an organisation is willing to provide sufficient resources to support the development and implementation of its strategy. As such, capabilities are a combined result of passive learning by doing and active investment in learning. MNEs with extensive internationalisation experiences would have the opportunity to nurture the capability to align their structure and process with their strategies (Huy, 2011).

2.11.8 Employee participation

Bahmani and Farhadpoor (2017) say that, although managers engage in decision-making processes at different levels and their decision-making roles are related to non-structural decisions. Information gained from the external and internal sources of an organisation is processed and fed into the decision-making cycle by individuals and the information system of an organisation (Sadegzadeh, Hasanzadeh & Najafgholinezhad, 2013). Thus, environmental scanning is a process to collect information from the external environment of an organisation, and its analysis, interpretation and use in decision-making by managers.

Furthermore, as Sarrafizadeh (2011) states, organisational decision-making requires a structure in which a manager is able to acquire sufficient information about what goes on in the environment. To put it in simple words, depending on information which originates from inside an organisation cannot guarantee the success of decisions.

Sarrafizadeh (2011) states that Henry Mintzberg (1973) enumerates 10 roles for managers in the three general fields of communication, information dissemination and decision-making where a manager solves future problems, identifies objectives and dedicates the resources needed. Thus, environmental scanning is a process to collect information from the external environment of an organisation, and the analysis, interpretation and use of the information in decision-making by managers. Choo (1996) states that environmental scanning is the acquisition and use of relevant information regarding events, trends and relations in the external environment of an organisation and the knowledge which helps managers in planning future affairs of the organisation. Analysis (investigation and evaluation) is crucial for modern organisations.

Organisation management can be split into three levels as reflected in Figure 2.10. Each of these levels is responsible for their tasks and responsibilities. The lower level is usually supporting the higher level and each task in each level is managed by manager from the defined level.

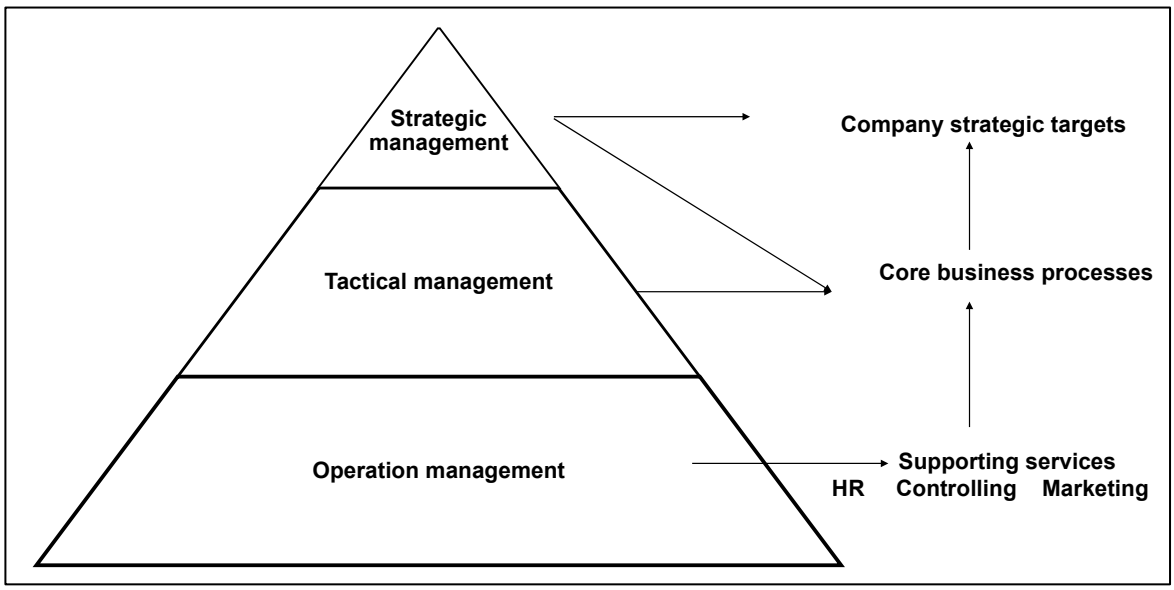

Figure 2.10: Organisation management

Source: Maryska and Sladek (2017)

Maryska and Sladek (2017) indicate that when we want to examine performance, we must first define the management level we want to work on. In the area of products and services, the

strategic level is the performance of the whole services portfolio or existence of service in the portfolio. The tactical level corresponds with added value created for users or service usage type. On the operational level the service performance deals with SLA fulfilment and response times.

To summarise, although managers engage in decision-making processes at different levels, their decision-making roles are basically related to non-structural decisions.

2.12 EMPLOYEE PERFORMANCE AS AN ENABLER TO AN IMS

This section presents enablers for employee performance.

2.12.1 Human relations theory

The human relations movement began with the Hawthorne Studies (Roetttlisberger & Dickson, 1939) at the Hawthorne Plant of Western Electric. To some extent, the Hawthorne Studies were a rejection of the concepts of scientific management as the researchers used concepts from psychology and sociology to explain worker behaviour. So, even if the classical theorists designed a near-perfect organisation and scientific management principles were also applied, those who were involved in the human relations movement would argue that problems would still occur because of individuals and groups of workers who “did not behave the way that the rational prescriptions of economic man said they should behave” (Scott & Mitchell, 1972). The Hawthorne Studies (Roetttlisberger & Dickson, 1939) highlighted the behavioural aspects of the work environment and were the forerunner of later efforts to integrate psychological and sociological concepts into the management of organisations.

Winship (2005) notes “The concern to elucidate the nature of human relations through dialogical exchange in psychoanalysis certainly anticipated, if not influenced, the evolution of industrial psychology; beginning with the famous Hawthorne Experiments between 1924-1927 led by Elton Mayo (1933) at the Western Electric Organisation in Chicago.” Mayo (1923, 1930, 1933) was the first to introduce a “non-directive” form of interviewing which enabled the research participants to respond more candidly to the researchers’ questions. As a result, the employees’ responses proved to be a great deal more illuminating than those obtained through closed questions. Working conditions, i.e. length of breaks, lighting, and the length of the workday, were modified with each condition lasting for 12 weeks. The unexpected results of the studies showed that changes in working conditions had little influence on the levels of productivity. Researchers found that peer group relations among the workers had more influence on the level of output than working conditions. In some subgroups, the peer pressure

was applied so strongly that it would restrict productivity. Mayo (1933) found that it was an understandable and interpersonally contented group of workers that was far more productive than an incoherent or antagonistic group. This was a landmark discovery that is now considered vestigial although at the time of the experiment without prevarication the results were directly contra positional to the carrot and stick mentality of production management. According to Winship (2005), Mayo's classic research became a benchmark for aligning the emotional condition of the worker with his or her capacity for productivity. Still it is questionable whether the Western Electric Organisation research would hold up to the rigorous standards required in today's empirical testing of organisational theories.

2.12.2 Industrial humanists, motivation, and organisational behaviour

Industrial humanists (e.g. Likert, 1961) went beyond the amendments of classical and scientific management theory of the human relations movement. Instead, sought dramatic changes that would bring about "greater freedom and satisfaction at work" as well as "freedom from oppression and an opportunity for self-determination" (Scott & Mitchell, 1972).

Scott and Mitchell also felt that the consideration of organisational behaviour theories must first include the consideration of "perception, motivation, and personality development (Scott & Mitchell, 1972). Blair (1969) describes perception as, the process is one of selection and organisation of sensations to provide the meaningful entity we experience. So, people perceive things, situations, people (through their words and actions). Once the perception occurs, people are then motivated to think and/or behave in certain ways. However, the perception itself is influenced by an individual's personality. While some personality traits are unique to an individual, there are some in personality consistencies that are worthy of scientific research.

Some of the early motivation theories include Maslow's Theory (1943) and Herzberg's Theory (1966). Maslow's hierarchy of needs includes safety (freedom from fear), love (affectionate relationships), esteem (personal worth and the need to be deemed worthy by others), and self-actualisation (the need to fulfil one's potential). Maslow (1970) defines the self-actualisation need as the need to become everything that one is capable of becoming. Once a need is satisfied, it ceases to drive behaviour. Expectancy theory was originally developed by Lewin (1951) and specifically applied to motivation at work by Vroom (1964). Vroom noted that the extent to which individuals expect outcomes to satisfy them will cause the individuals to be motivated to move toward achieving those outcomes. He discusses valence (the anticipated satisfaction) versus actual satisfaction from the outcome. This gave managers a theory that said they should understand which outcomes will motivate individuals so that the managers can provide, and/or assist in worker achievement of those outcomes (Vroom, 1964). As these

and other theories of motivation were discussed, Festinger (1957) published *A theory of cognitive dissonance* noting that when individuals do something that is counter to what they believe, they will experience cognitive dissonance. This theory is important to managers who require workers to perform jobs that they find distasteful or which they believe contradict their personal values.

2.12.3 Improving performance through empowerment

The concept of work design considers how an organisation enables employees to achieve higher levels of performance. High performance work is characterised by flexibility, innovation, knowledge and skill sharing, alignment of work with organisational objectives, customer focus, and rapid response to dynamic business needs (Boys & Wilcock, 2014). Within this framework, work design is closely linked with empowerment and strategic planning. Fair compensation, career progression, and practices that enhance employee well-being and satisfaction are other related concepts. As an example, through augmenting worker job satisfaction, an increase in productivity may be obtained, which can imply greater efficiency in the organisation (De Oliveira Matias & Coelho, 2010).

2.12.4 Employee performance management

According to Maryska and Sladek (2017), measuring results and performances have a long tradition. Rapid development in this area is visible especially in the last ten years. However, Burita and Zeman (2017) argue that errors in business processes result in poor data accuracy. Dordević et al. (2010) posits that achieving business excellence in SMEs is viable in two ways: by implementing concepts of total quality management (TQM) and the integrated management system (IMS). Management is the function that coordinates the efforts of people to accomplish goals and objectives by using available resources efficiently and effectively (Hitt, Ireland & Hoskisson, 2014).

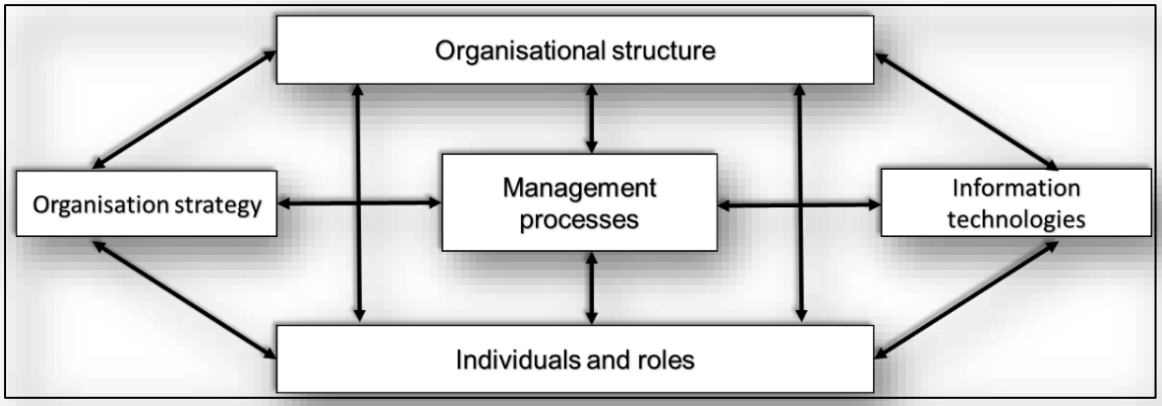

Figure 2.11: Morton's model of organisational efficiency

Source: Morton (1991)

Organisational structure defines how activities such as task allocation, coordination and supervision are directed toward the achievement of organisational aims (Avison, Jones, Powell & Wilson, 2004; Hill & Jones, 2012).

All of these definitions and others enter into Morton's Model. The most important components of the organisation are (Allen & Morton, 1994):

- organisational structure and corporate culture;
- individuals and roles;
- organisation's strategy;
- information technologies; and
- management processes.

According to Figure 2.11, all components mentioned in the model are important, but information technologies and individuals are the most important ones (Allen & Morton, 1994; Morton, 1991). Individuals, and human resources in general, are the essence of the organisation and the crucial factor that influences other components in the model.

The research by Bernado et al. (2015), indicates that the dimension of increasing performance in an organisation is one of the most highlighted IMS benefits. Anderson and Butzin (1974) confirm that performance equals motivation multiplied by ability. According to Patience (2008), although there was no ISO standard for IMS, several countries such as Belgium, France, and Denmark had national guidelines for an IMS at that stage. The Danish standard of IMS is called

DS 8001 and is a guidance document prepared in 2005 by the Danish Standards Association. It states the common elements in an integrated management system as (DS 2005):

- management processes such as strategy, policies, internal audit, resources and organisation;
- business processes such as internal and external communication, management and planning, maintenance; and
- supporting processes such as document management, registration, training and description of management system.

The fact an organisation needs to work together as demonstrated by Allen and Morton (1994) talks to Bernado et al. (2015) description of organisational performance. Furthermore, in Denmark 90% of organisations with at least two management systems have integrated their management systems (Buhl-Hansen, Christensen, Eliassen, Jorgensen & Vestergaard 2008). In 2007, a survey of IMS experiences in Danish organisations found that 91% of the organisations with three or more certified management systems have implemented an IMS and 90% of the organisations who participated in the survey have integrated their management systems on the correspondence level as well as the generic level, and have achieved time and cost reductions as a result (Rasmussen & Jorgensen, 2007). Another piece of qualitative research carried out in Denmark, involving three production organisations, showed that one had correspondent level integration while two had generic level integration (Buhl-Hansen et al., 2008). The organisation with a correspondent level is an SME while the two organisations with generic level are large international organisations.

Dordević et al. (2010) indicate that business excellence implies that organisations continuously work on enhancing the quality of business operations of their organisation based on the rise in each staff member's performance and knowledge. Achieving business excellence (winning the market position of an excellent organisation) and creating world-class products and services cannot be connected with only one segment or business function of an organisation or organisational entity, but they are a result of the collective work of all structures within the organisation conforming to the predefined strict goals of business operations. According to Maryska and Sladek (2017), management requires information not only about the organisation as a whole but also detailed information about each of organisation's parts. These necessities are closely connected with the organisation's owners' requirements for providing information about the organisation's economic situation. This is an important part that has been confirmed by the Scott Morton's model that proved in his model that this is one of the crucial organisational components (Gamayanto, 2005).

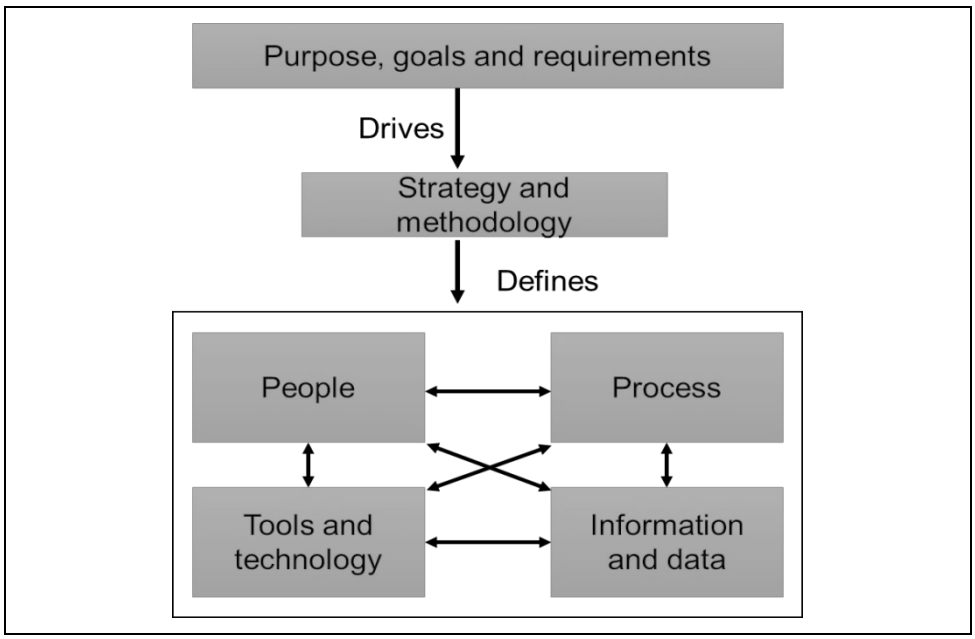

Figure 2.12: Business informatics performance management system

Source: Maryska and Sladek (2017)

According to Maryska and Sladek (2017), the purpose of BIPMS is to support the decision-making process by measuring the current level of performance and help with meeting the desired orgaisational performance levels. This general purpose can be more detailed or specified according to organisational needs. From the figure above, implementation and evolution of BIPMS are governed through the definition of the BIPMS strategy and the setting of a methodology for implementation. Both of these artefacts define the architecture and relationships between four basic BIPMS components.

- 'People' covers owners, customers, users, roles and organisation structure.
- 'Processes' are ways by which performance management is governed, changed, used and operated.
- 'Technology' includes the tools and technology that are necessary assets to provide support for performance management.
- 'Information and data' covers data sources, transformation, key performance indicators (KPIs) and information outputs that are produced from performance management discipline.

Interaction and integration between BIPMS components is the basic way how performance management is executed.

2.13 EMPLOYEE MOTIVATION AS AN ENABLER FOR AN IMS

Maslow (1970) presented his theory of human motivation based on a hierarchy of five sets of needs. In Figure 2.13 the author presents the needs that were arranged in a hierarchy ranging from physiological to safety, social, ego and self-actualisation needs. It is interesting to note that the theory itself was never conceived with management or organisations in mind.

Herzberg's two-factor theory (1966) holds that there are two types of motivators: extrinsic and intrinsic. Extrinsic factors include factors such as pay, supervision, working conditions and job security. The extent to which extrinsic factors are absent (or not at an acceptable level) causes job dissatisfaction, but their presence above the acceptable level does not cause job satisfaction. Intrinsic motivation factors include achievement, recognition, and the responsibility for work. Intrinsic factors cause job satisfaction (Herzberg, 1966).

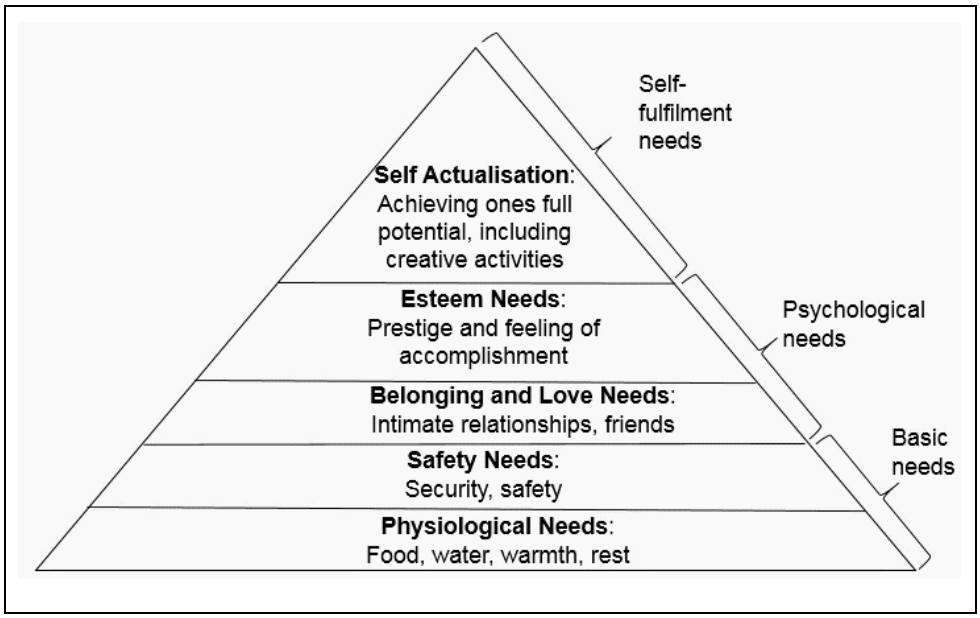

Figure 2.13: Maslow's hierarchy of needs

Source: Maslow (1970)

According to Blau (1960), a member of a group who utilises his or her superior qualities for the benefit of others not only makes himself an attractive associate, but also earns respect and deference. By rendering significant services, he or she establishes social obligations. If he or she helps the rest of the group to attain important objectives, collectively or individually, they will be under obligation to him or her. Blau (1960) found that a person who is motivated to attain an integrated position in a group has strong incentives not simply to wait until the others discover his or her good qualities, but to exert an effort to prove himself an attractive associate. He or she will try to impress them. This involves, essentially, revealing characteristics that he

or she assumes to be positively valued by the others and concealing those he or she expects to be negatively valued. Self-deprecation thus removes the threat his or her attractiveness has posed for the other members and induces them to act upon their feeling of attraction to him or her by engaging him or her in social intercourse. It serves, consequently, the function of contributing to social integration. When a member surrenders his or her claim to superior standing in the group, he or she invites others to follow his or her example; and, the more members who do so, the easier it becomes for the rest to do likewise.

From Figure 2.14, much case research suggests that HR considerations such as employee empowerment, training, work design, and incentive structures are essential to the efficient and successful functioning of management systems (Boys & Wilcock, 2014). This will enable employees to strive for level 3 of organisational commitment.

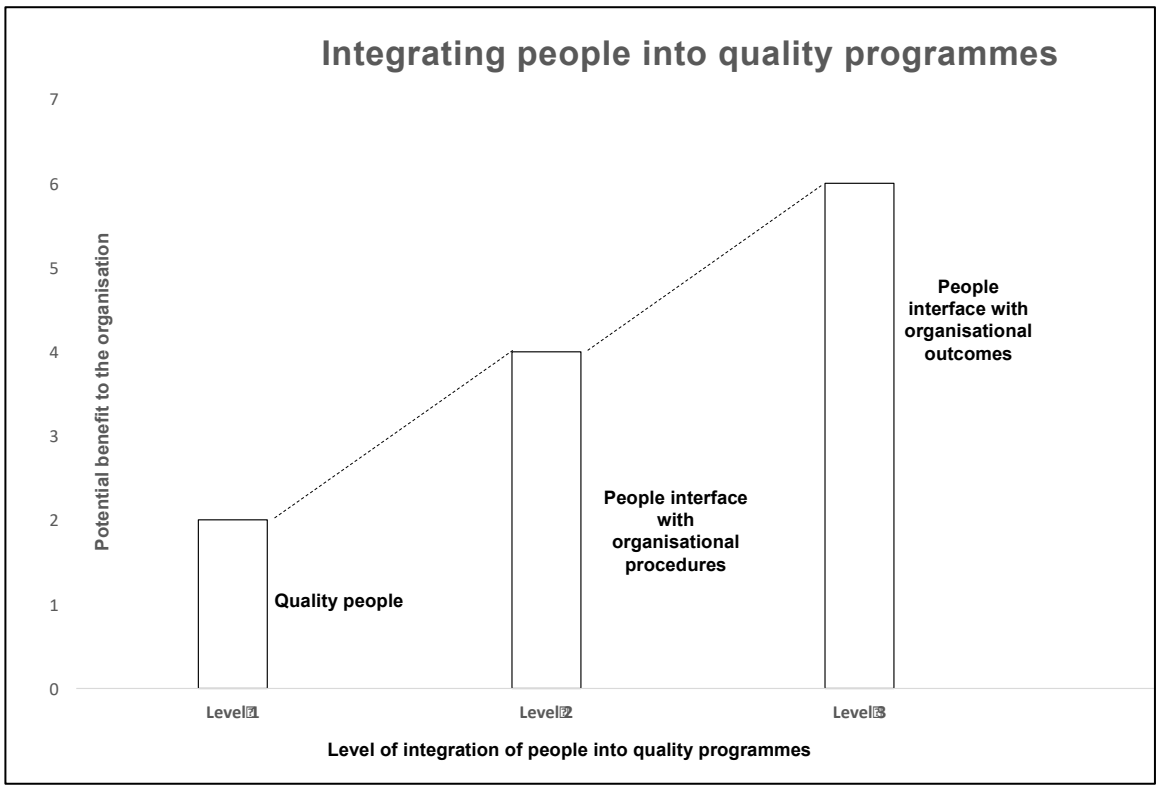

Figure 2.14: The path from basic to advanced levels of organisational commitment to integrating people into quality programmes

Source: Boys and Wilcock (2014)

The job enrichment approach, which was initially developed from Herzberg's work, maintained that workers could be motivated by positive job-related experiences and by providing employees with more control over their job tasks. Lupton (1976) described Herzberg's (1966) ideas in the following way:

> If you wish (as employer or manager) to have an efficient organisation, you must set to work to improve the performance of the individuals who presently work for it. It does not matter who the individuals are, what they can do, what they are doing, what the organisation does, how it does it, or what it is, there will always be scope for re-dividing and re-designing its tasks so as to enrich them, and for so arranging the context of administrative procedure, supervision and interpersonal relationships, that they will not inhibit motivation and satisfaction.

Simon et al. (2012a) suggest that the lack of employee motivation appears as the main difficulty in integrating systems.

2.14 ORGANISATIONAL CULTURE AS AN INTEGRATING FACTOR

Kotler and Armstrong (2006) theorises that the cultural environment consists of all the institutions and forces that have an effect on the basic values, perceptions, preferences, and behaviours of the members of a society. Workplace culture refers to the values, beliefs, norms, customs, and practices of an organisation (Ott, 1989). Although the influence of a successful TQM on workplace culture has long been recognised (Deming, 1986; Juran, 1988), the importance of the inverse relationship, the effect of workplace culture on the success of TQM initiatives, has only recently been acknowledged (Metri, 2005; Rad, 2006). Organisational culture is the underlying values, beliefs and principles that are the foundation of organisations' management systems (Eustace & Martins, 2014).

Castro and Martins (2010) claim that organisational culture has deep roots in organisations and uses employees' values, beliefs and assumptions as its basis. Vision development and strategy decision-making processes are strongly influenced by organisational behaviours and the cultures of organisations and nations.

Bennis (2003) says that democratic governance has forced several things:

- the re-conceptualisation of man (man is aware and rational);
- a new concept of power (management and workers can collaborate); and
- organisational values (now with a more humanistic bias that reinforces man's natural inclination toward democracy).

The work of Maslow (1970) had a major influence on the change from autocratic governance to a more democratic type of governance.

The framework posited by Denison and Spreitzer (1991) and McDermott and Stock (1999) have reported that a competing values framework (CVF) is both theoretically sound in integrating organisational culture to other organisational components, and can be operationalised as a psychometrically sound instrument (Yeung, Brockbank & Ulrich., 1991).

The CVF framework illustrates four cultural types as group culture, developmental culture, rational culture, and hierarchical culture (Quinn & Spreitzer, 1991). Each culture shows different values with reference to motivation, leadership and strategic orientation in organisations (Cameron & Freeman, 1985; Denison & Spreitzer, 1991; McDermott & Stock, 1999).

The CVF framework has been diagrammatically presented as shown in Figure 2.15 below. CVF assumes that all four quadrants are ideal for organisations (McDermott & Stock, 1999). Organisations rarely follow only one culture type. To some degree each organisation demonstrates a combination of different culture types, albeit the case that one type override another (McDermott & Stock, 1999; Quinn & Spreitzer, 1991). According to Quinn and Spreitzer (1991), the rating of four culture types might vary independently as referred to in Figure 2.15. For instance, a high rating on one end (e.g. internal orientation) does not exclude a high rating at the other end (e.g. external orientation) (McDermott & Stock, 1999).

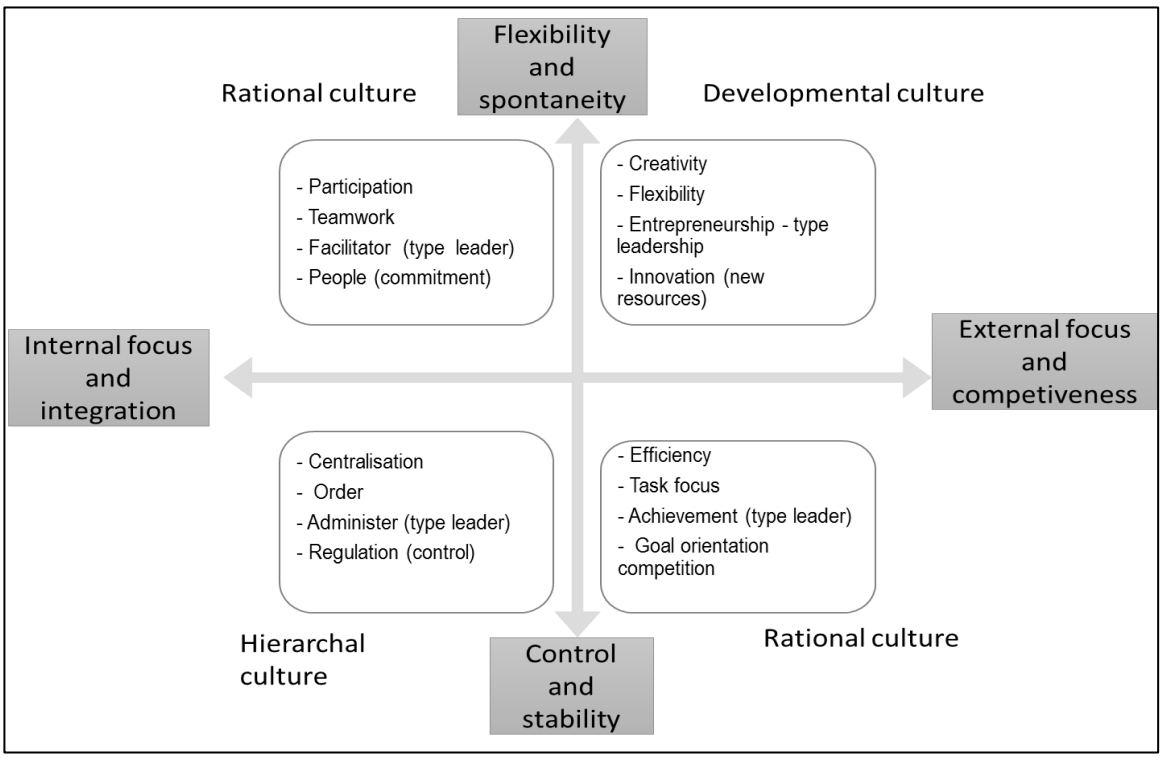

Figure 2.15: The competing values framework (CVF) of organisational culture

Source: Cameron and Freeman (1985) and Denison and Spreitzer (1991)

Therefore, while utilising CVF for assessing the organisation's culture, it is essential to determine the associations between culture types and different facets of the construct.

Idris, Wahab and Jaapar (2015) found that factors such as the use of information for improvement, allocating authority equal to responsibility, attitudes regarding job security,

approaches and incentives for teamwork and collaboration, opportunities for learning and involvement, fostering a climate of fairness, and providing compensation based on equality are some of the many organisational factors which shape workplace culture. Weber, Drori and Tarba (2012) found that strong cultural integration between member organisations and a corporate office culture are critical factors of the corporate group success. For example, Weber, Drori and Tarba (2012) research findings showed that 89% of newly acquired businesses in the United States fail to succeed because of a lack of integration between member organisations and the corporate office culture.

Firm traits and aptitudes refer to the resources and capabilities that an organisation possesses to compete in the global marketplace. These resources and capabilities can take on different forms such as culture, knowledge, orientation, experiences, and learning capability. Studies suggest that a fundamental antecedent to superior performance is the corporate culture of the firm (Huy, 2011). Establishing an effective organisational culture in the corporate group is an important strategy to advance efficiency in the organisation (Idris et al., 2015). Therefore, from the theory the following hypothesis will be tested:

H_0^2 There is no relationship between organisational culture and organisational efficiency.

H_2 There is a relationship between organisational culture and organisational efficiency.

In hypothesis 2, organisational culture is considered to be the independent variable and organisational efficiency is the dependent variable. The null hypothesis is that the relationship between organisational culture and efficiency is zero. The alternative is that there is a relationship between organisational culture and efficiency.

Organisational culture describes the focus of management's attention. By definition, management cannot focus on everything at once. An orientation toward throughput, i.e. toward generating more money with current resources, implies that management focuses its attention in the direction of increasing throughput rather than in the direction of minimising costs. The organisational culture construct is related to the performance measurement system construct because a firm that has an organisational culture oriented toward throughput will be more likely to adopt a cost system that measures organisation-wide progress toward the goal of making more money than to adopt a system that supports minimising costs as a means to improve profitability.

Both organisational culture and motivation systems are related to efficiency of an organisation, in that if an organisation's cultures are focused on throughput, then it is more likely that the

organisation will make decisions based on the influence of local actions on global results, rather than attempting to optimise all resources locally (Cater & Pucko, 2010). Therefore, from the literature, the following hypothesis will be tested:

H_0^3 There is no relationship between organisational culture and employee motivation.

H_3 There is a relationship between organisational culture and employee motivation.

In hypothesis 3, organisational culture is considered to be the independent variable and employee motivation is the dependant variable. The null hypothesis is that the relationship between organisational culture and employee motivation is zero. The alternative is that there is a relationship between organisational culture and motivation.

The perception and the understanding of emotional experiences are different among people from different cultures because culture influences which events trigger emotions and determine the norms of emotional expression (Matsumoto, 2001). Cultural differences cause communication problems, misunderstandings, and conflicts between the top management teams, which in turn can cause stress and negative attitudes among the acquired managers (Weber et al., 2012). Therefore, from the theory the following hypothesis will be tested:

H_0^4 There is no relationship between management and organisational culture.

H_4 There is a relationship between management and organisational culture.

In hypothesis 4, management is considered to be the independent variable and organisational culture is the dependent variable. The null hypothesis is that the relationship between management and organisational culture is zero. The alternative is that there is a relationship between management and organisational culture.

2.15 INNOVATION AS AN ENABLER FOR KNOWLEDGE TRANSFER IN ORGANISATIONS

Innovation is defined the commercialisation of all new combinations based upon the application of new materials and components, the introduction of new processes, the opening of new markets, and/or the introduction of new organisational forms (Schumpeter,1934). Innovation, as understood by Rogers (2003:475), as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption”. Systematic technology innovation must be integrated with effective business-related changes in and outside an organisation (e.g. adjustment of related jobs, new performance and quality standards, adjustment of supply, storage and sale capacities, marketing and PR, modification of calculations and budgets) Jemala (2012). According to Boudreau and Lakhani (2009), innovation refers to new applications of

knowledge, methods, and skills that can generate enhanced products and processes to meet customer demands and market needs (Kim, Kumar & Kumar, 2013). Innovation enables manufacturers to transform value propositions and improve agility and flexibility (Tongur & Engwall, 2014), and therefore, the manufacturers can quickly respond to changes in environments and benefit from market dynamics, which are fundamental for their competitiveness (Lim, Han & Ito, 2013; Manu & Sriram, 1996).

Innovations can take different forms such as upgrades, extensions, and major changes in existing products and processes (Kim et al., 2013). In the MIT Sloan Management Business Review Boudreau and Lakhani (2009) suggest that if the innovation problem involves cumulative knowledge, continually building on past advances, then collaborative communities have inherent advantages. Organisations are naturally oriented toward solutions that depend on integrating the skills and knowledge of employees and technologies. In fact, successful organisations necessarily have knowledge-sharing and dissemination mechanisms designed into them. They also tend to converge on common norms with a culture of sharing and cooperation, broad agreement on a technology paradigm and common technical jargon to support productive collaboration. Therefore, from the theory the following hypothesis will be tested:

H_0^5 There is no relationship between employee performance and innovation.

H_5 There is a relationship between employee performance and innovation.

In hypothesis 5, employee performance is considered to be the independent variable and innovation is the dependent variable. The null hypothesis is that the relationship between employee performance and innovation is zero. The alternative is that there is a relationship between employee performance and innovation.

Boyne, Williams, Law and Walker (2005) argue that decisions made by higher bodies of organisations do not guarantee the adoption and use of innovations. Furthermore, Palm, Lilja and Wiklund (2016) found that integrating and achieving a balance between improved quality and increased innovation is not an easy task. The large-scale adoption of an innovation such as the electronic lawsuit by Brazilian labour courts should take into account that both internal and external users must accept the new system and that it is necessary to take steps to simultaneously overcome resistance and increase the acceptance of innovation.

Furthermore, Sousa and Guimaraes (2017) identified three organisational routines derived from the innovation process at the Brazilian Superior Court of Justice (Superior Tribunal) electronic management, project management and process management. In their research of

the Brazilian judiciary, overall, three strategies of developing and adopting innovations were identified namely:

- The first refers to a centralised, top down strategy, in which the Higher Council of Labour Justice disseminates a particular idea or practice to be followed by the courts.
- In the second strategy, the development and adoption of innovations occur through inter-organisational relationships via discussions and agreements among courts interested in jointly developing or adopting innovations already consolidated in another court.
- The third strategy represents specific courts' autonomous initiatives to develop and adopt innovations. It is essential to identify the capabilities and resources that are involved in the development and adoption process of innovation.

The capabilities and routines related to the electronic lawsuit that were identified by the interviews comprise specific organisational practices and have different scopes. These practices can be classified into capabilities involving court administration as a whole, specific management capabilities related to IT, and capabilities that promote inter-organisational relations as depicted in the figure below. In the MIT Sloan Management Business Review (Boudreau & Lakhani, 2009), external innovation is also a point to note especially when the technology, design and innovation approaches have yet to be established or when customer needs are highly varied or not yet fully understood, then opening up the innovation to the external world can have considerable advantages. The classic example here is the multibillion-dollar video game industry, where organisations (Nintendo Co., for example) develop a hardware console (Wii) and encourage third-party businesses to write game software for that platform. In a market, external innovators are busy focusing on their own economic interests, which often results in fierce competition and little cooperation among them (Boudreau & Lakhani, 2009). A crucial thing to remember is that an organisation's innovation strategy does not have to be cast in stone. That is, managers can evolve the strategy in ways that make the most sense for their particular business.

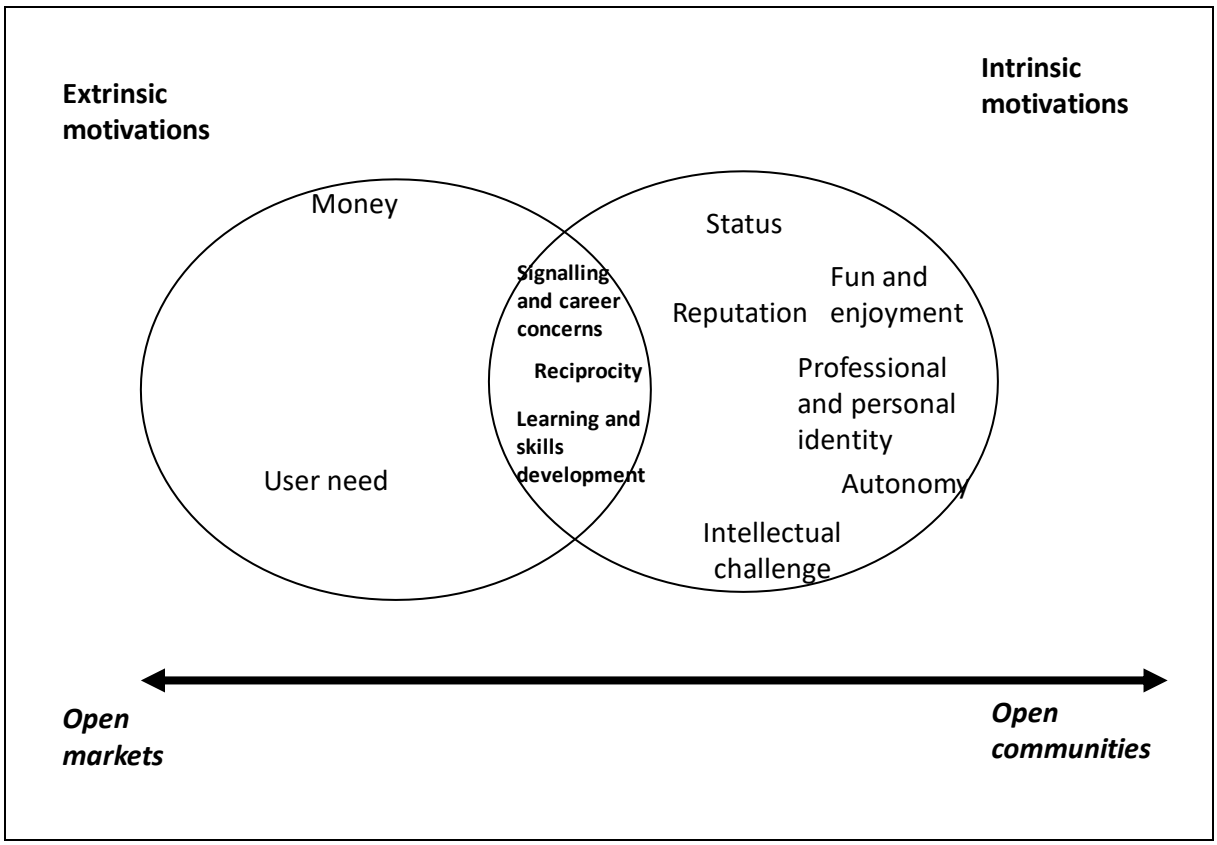

Figure 2.16: Extrinsic and intrinsic motivations for innovation

Source: Boudreau and Lakhani (2009)

From Figure 2.16 it can be deduced that the wide range of motivations that draw outside innovators to participate in a project can be classified into two broad categories: extrinsic and intrinsic. As a simple approximation, markets tend to favour the former, and communities are more oriented toward the latter (Boudreau & Lakhani, 2009).

Sousa and Guimaraes (2017) found in their literature review three organisational routines derived from the innovation process at the Brazilian Superior Court of Justice:

- electronic management;
- project management; and
- process management.

From an innovation perspective, knowledge intensive business organisations may create the added value and competitive advantages of an organisation. Good quality of the knowledge-based innovation business training process has been shown to make an important contribution to organisational success (Brinkerhoff, 2005; Harel & Tzafrir, 1999). Furthermore, Palm et al.

(2016) posit that previous research indicates a complex and ambiguous relation, raising questions as to how to combine these two approaches optimally (quality and innovation), organisationally, operationally, and culturally. Is there an 'edge of chaos' where there is maximal flexibility for innovation while maintaining sufficient order for quality?

2.15.1 Knowledge value strategy

The knowledge value strategy is a strategy decision based on knowledge intensive business services (KIBS). According to Chen (2016), the exploration strategy identifies four areas as identified in Figure 2.17.

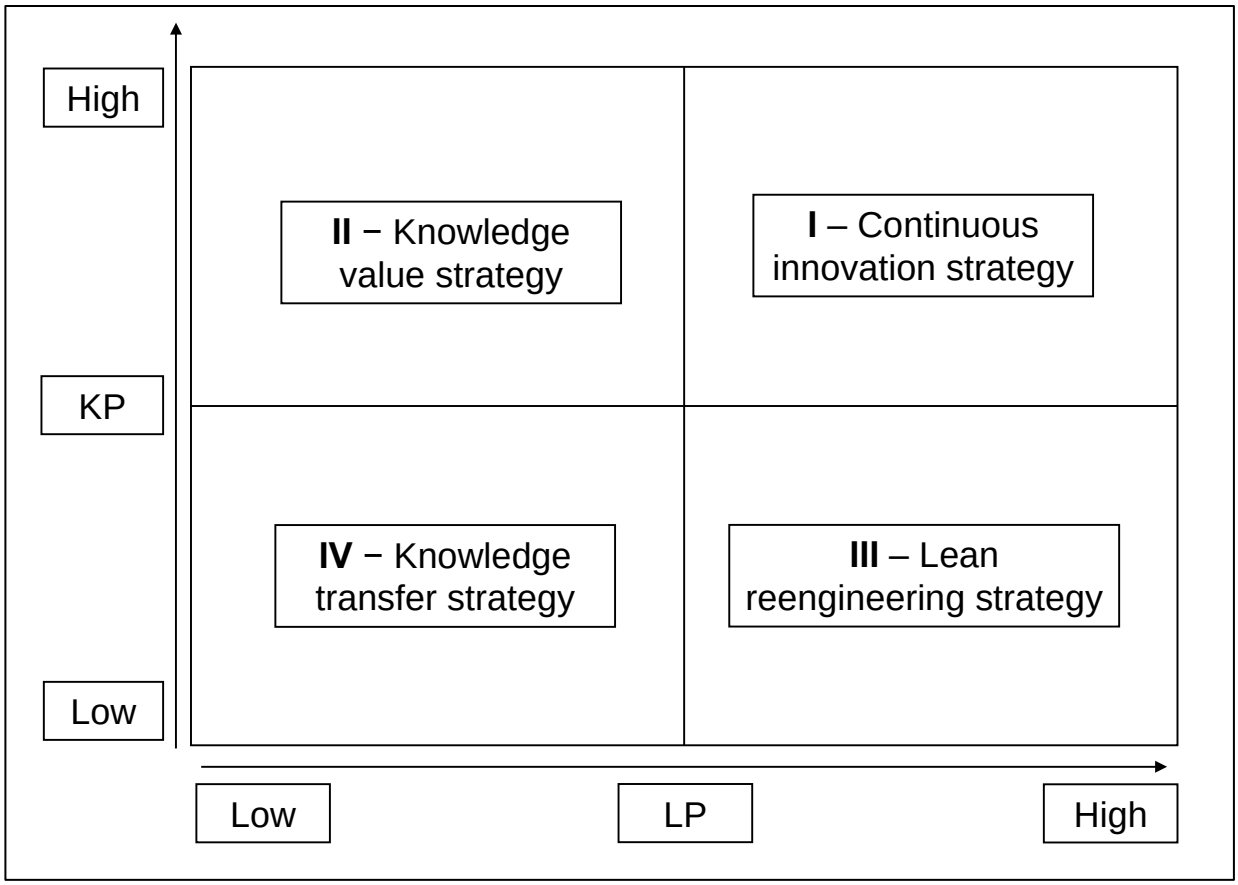

Figure 2.17: Exploration strategy

Source: Chen (2016)

2.15.2 Continuous innovation strategy

The continuous innovation strategy aims at capability in creating both innovation and continuous improvement based on business performance perspectives. The capability of an organisation to achieve business excellence along multiple competitive factors, such as high

quality lean service and knowledge innovation activities, is increasingly regarded as a source of benchmarking (Chen, 2016)

2.15.3 Lean reengineering strategy

The lean reengineering strategy is to reduce waste and non-value added activities for increasing productivity, enhancing quality, shortening lead times. Here the stakeholders participate to contribute to continuous improvement activities. The objective of this strategy is to determine whether training process reengineering of lean thinking in organisations improves efficiency and productivity.

2.15.4 Knowledge transfer strategy

Knowledge transfer is mainly an activity of knowledge management when an organisation recognises a lack of knowledge (Chen, 2016). Knowledge consists of two types, such as explicit knowledge, transferred by a database and tacit knowledge, transferred by interpersonal communication.

2.15.5 Integrating quality and innovation

According to Sousa and Guimaraes (2017), capabilities related to quality interaction with other organisations also helped in the adoption of innovation, such as sharing resources in jointly developing tools, training and learning opportunities, adopting complementary innovations and exchanging information.

The empirical findings by Palm et al. (2016) show however, that there is a common understanding that the organisations need management and strategies not only for quality management, but also for innovation. The findings suggest that innovation and quality management may be handled side-by-side and that it is necessary to identify exactly where quality management and innovation management strengthen or hinder each other. An important step in the identification of where quality management and innovation management strengthen or hinder each other was taken by Steiber and Alange (2013;49) who emphasise that the main differences between quality management and innovation seem to be the overall management focus, and on the concrete design of organisational structure and management processes.

Palm et al. (2016) submit that superior customer value can be achieved through increased focus on innovation management and further that the following propositions on how quality management and innovation management could strengthen each other.

- The organisations' management should analyse and develop the organisational culture and HR management in order to create a more fertile ground for an innovative climate in the organisations.
- The organisations' management should put significantly more focus on structures and practices in order to address innovation issues on a daily basis.

Ng and Ang (2011) state that quality is generally about conformance to standards with the ultimate purpose of amplifying organisational efficiency while innovation is about breaking new ground. However, it is unclear how organisations actually integrate quality and innovation into a coherent and powerful strategic package to improve efficiency. Therefore, from the theory the following hypothesis will be tested:

H_0^6 There is no relationship between organisational efficiency and innovation.

H_6 There is a relationship between organisational efficiency and innovation.

In hypothesis 6, organisational efficiency is considered to be the independent variable and innovation is the dependent variable. The null hypothesis is that the relationship between organisational efficiency and innovation is zero. The alternative is that there is a relationship between organisational efficiency and innovation.

2.15.6 Innovation in technology management

Integrated technology management should enable an organisation better to evaluate, plan, carry out, link, and control technological processes and elements so that they are mutually supportive and synergistic. However, integration of technology management (TM) processes does not only mean technology integration activities. These activities are mainly targeted at analysing, evaluating and developing a better technological system (Iansiti, 1997). Integration of TM processes also requires the integration of various departments and levels of management (Madhani, 2011). Integrating technology capacities with customers' needs, technology with business strategy, technology and other business processes, and technology elements and processes often require a three-step mechanism of TM, namely integration of technology identification, implementation, and potential technology commercialisation processes (Gunasekaran & Ngai, 2004). All these processes should be properly connected and implemented systematically. Systematic technology innovation must be integrated with effective business related changes in and outside an organisation (e.g. adjustment of related jobs, new performance and quality standards, adjustment of supply, storage and sale capacities, marketing and PR, modification of calculations and budgets). These activities should be a part of systemic planning and implementation processes within integrated TM

(Leonardi, 2008). These processes can be supported by different stakeholders, e.g. technological suppliers that can be a significant source of information and inventions, outsourcing organisations that can be technology integrators as well, etc. Currently, the integration of technological systems from a variety of vendors or developers can be seen as the main issue in the ICT industry. Many larger organisations have therefore established special formations for the preparation of technology implementation processes (Peslak, 2011).

For example, IBM has developed the IBM Interactive Team, which is designed to spread the vision, mission, business strategy, acquired technology innovation, new management or marketing expertise through the worldwide network of IBM centres. New technological know-how is initially approved by an internal technology assessment process and subsequently distributed to other IBM centres. These centres offer a unique think tank in which experts collaborate with users, and thus better evaluate, plan, develop, link and start new technological projects. The IBM Interactive Team enables performance of user-oriented technology analyses and surveys (industrial or end users) and on-line technology integration and implementation (IBM, 2010).

Technology innovation and changes as outputs of internal R&D activities are usually highly conditioned by marketing analyses and management requirements. Technology innovation can also be conditioned by suppliers, who may be a very valuable source of inventions. However, technology innovation can also be an outcome of technology transfer or an outsourcing process Jemala (2012), For any type of gathering of improved or new technology, there is always a need to plan and integrate these processes adequately in terms of required resources, capacities, networks, time frames, relationships to existing business processes, and expected outcomes. The most appropriate visual instrument in this context can be a road-mapping plan designed to integrate resources, capacities, technologies, products, markets or customers in order to achieve strategic business objectives. This integration should also take place at every level of the plan, in terms of time series of individual elements of the plan. A road-mapping plan reflected in Figure 2.18, displays several variant technological scenarios for possible different states of the environment figure below.

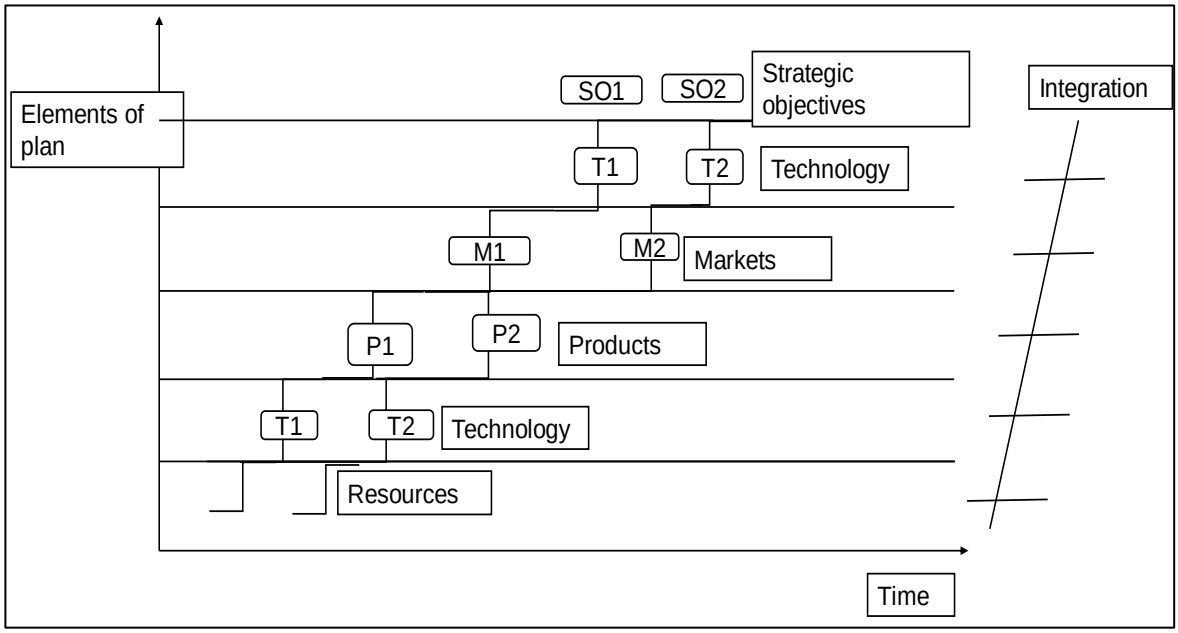

Figure 2.18: Technology innovation integration using a road-mapping plan

Source: Jemala (2012)

Capacity limitations and risk constraints require an organisation systemically to allocate its resources and investment to a subset of possible technology projects. It is necessary not only to make technological capacities more flexible and to integrate them adequately, but also to use appropriate instruments in order to prepare and carry out optimal technology projects. However, there is also a need to identify trends and risks that may occur in an organisation innovation processes.

2.16 IMS AUDITING FOR CONTINUOUS IMPROVEMENT

Fayol (1949) delineated the elements of organisational administration into planning, organising, command, coordination, and control. Also, he developed 14 general principles of management: unity of command, unity of direction, discipline, division of work, authority and responsibility, remuneration, centralisation, scalar chain, order, equity, stability of tenure and personnel, subordination of individual to general interest, initiative, and esprit de corps. While often applied in different ways, those 14 principles of management are still respected as legitimate principles.

Urwick's (1937) writings helped crystallise classical organisation theory as acceptable to organisation scholars. Urwick (1937) added to Weber's (1947) and Fayol's (1949) theories the concepts of span of control, line-staff relationships, and functionalism. He called for improved application techniques because he felt that the rapid growth in scientific knowledge had placed

unprecedented strain on man's powers of organisation. He also noted that knowledge of, and interest in, organisation and coordination principles and techniques were meagre. Urwick (1937) seemed to understand organisational theories as scientific knowledge that needed to be understood and applied.

Audits represent an internal and external function (Bernado et al., 2015). Karapetrovic and Willborn (2010) say that in performing auditing activities, auditors must objectively and independently collect and verify audit evidence, evaluate it against audit criteria, and report their findings.

Regarding the internal audit process, Bernardo et al. (2009) divided it into three areas of integration:

- Not integrated: The internal audit is conducted by different teams, which are designed separately, and have different reports.
- Partially integrated: Usually the audit is conducted by a single team or performed simultaneously, but only for some items on the management system. Normally there is a single planning session, but different reports.
- Fully integrated: The audit is performed by a single team and/or performed simultaneously, there is a single planning session and it is issued in a single report.

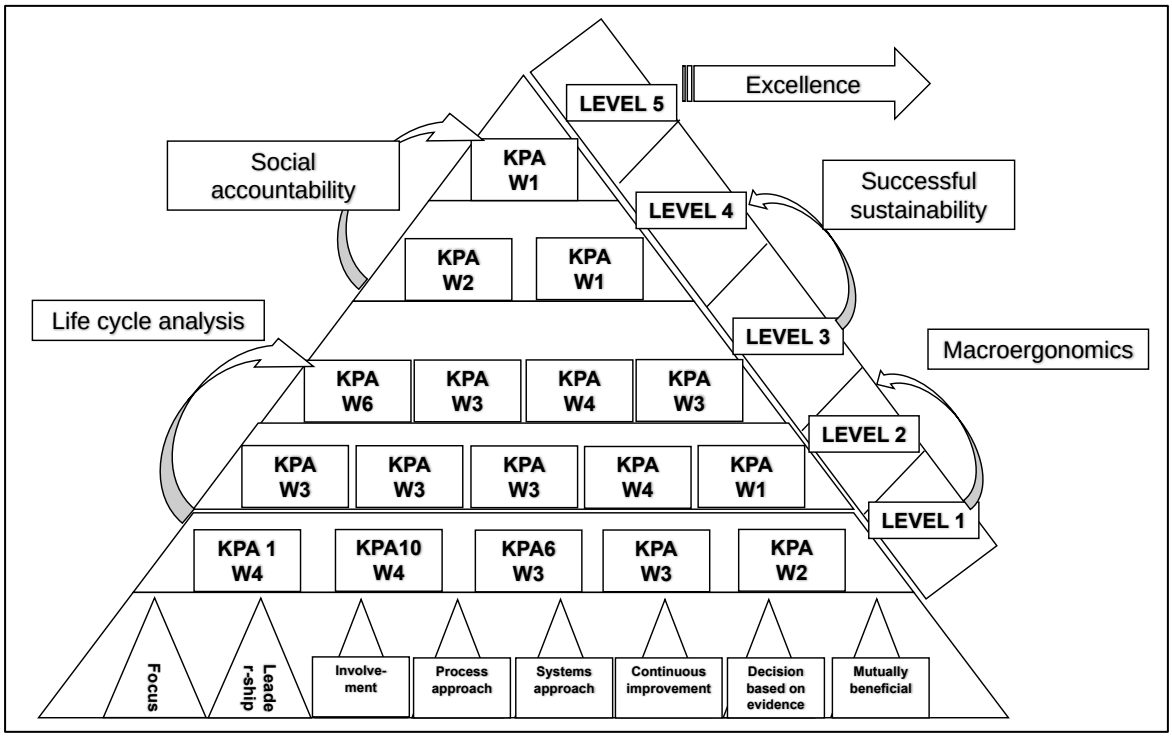

Figure 2.19: Maturity assessment framework

Source: Domingues et al. (2016)

Domingues et al. (2016) developed Figure 2.19 which acts as a showcase to be visualised by the organisations that intend to audit their IMSs. The most relevant information, namely, at which maturity level the IMS is located, the critical key performance areas (KPAs), the score achieved and the externalities that affect IMS maturity are displayed by the front office component. This is relevant information for IMS managers that intend to access an upper maturity level and to attain a deeper integration level. In addition to the KPAs, four so-called externalities (external features or constructs that affect the maturity level of the IMS). The externalities were allocated in ascending order taking into account their relevance to the external boundaries of the IMS, i.e. from the most related to the inner or internal organisational structure of the organisation (macroergonomics) to the one most related with the value that the organisation may add to the context. Dordević et al. (2010) refer to the crucial element of documentation that will be a mutual relationship between the input requirements and specific systems or procedures. This provides an easy verification in which all inputs must be worked out, thus facilitating the audit when input requirements are changed. It is a good practice to define the departmental input and output data, as well as to encourage the culture of an internal chain of information exchange. This will strengthen the concept that each department has a responsibility for delivery of a product or service within specific parameters.

Table 2.16: Audit team process

10	Efficiency measurement (audit-trail)
9	Circle (all employees invited)
8	Customer and supplier focus
7	HR focus (appointee for quality)
6	Products or service (CEO)
5	Objectives (appointees, employee and CEO)
4	Operation processes (project team)
3	Analyses e.g. environment (appointees, employee
2	Management policy (CEO)
1	Vision workshop (all employees and CEO)
0	Kick-off (all employees and CEO)

Source: Adapted from Mackau (2003)

From Table 2.16, it is clear that the initial meeting should be attended by all the employees and executives of the organisation. The subject of this meeting is to introduce the participants to the project and to present it (Mackau, 2003). The second part of the IMS implementation process is intended for the acceptance of the generated vision by all employees, suggesting compulsory attendance of all the empoyees. After the policy of the organisation has been produced by management, the general aspect of the management system functional

development is produced and explained. In the fourth part, the project team tends to identify, observe and revise organisational processes. The project team consists of employees acquainted with the process in their area of work. This group of employees is also accountable for formulating operating instructions. In the fifth step, the emphasis must be on improvement of goals through execution of the process and analysis, precise definition of goals and subsequent development of the plan of actions. Employees responsible for this task and the management equally participate in this part of the process.

The sixth step entails descriptions of the management's requirements related to products and/or services. The seventh and eighth steps are similar, namely possible activities linked to these topics were created by the team members and discussed with the management. As a result of these actions, the management passes a list of measures. A circle of continuous improvement requires producing a tool that allows all employees to discuss internal difficulties in the organisation and to find innovative solutions autonomously. This circle ensures that the management system will not limit structures and processes until they have been frequently evaluated and tested. The aim of the control of efficiency is to create a team of internal supervisors among the interested employees who, in collaboration with others, check objectives and efficiencies of action plans. Results obtained after all these processes have been done are entered in the manual structure, and all other issues are covered by the organisation's management. The final version of the manual has to be presented to the employees before implementation of the management system starts.

2.17 CHAPTER SUMMARY

The purpose of this chapter was to report on the literature pertaining to the IMS in organisations. Integration is a process of incorporating different levels of an organisation seamlessly, who share common strategic goals which interconnect in a cohesive manner to ensure the efficacy of all stakeholders. It is seen that it is essential that the management systems constituting an IMS interact well to produce the desired outcome and this can be done in an organisation by proactive and interactive management. It was also seen that the success of an IMS cannot be determined by a single measure. Finally, proactive and interactive approaches to planning are essential for IMS implementation. The literature review also exposed some of the important theories related to the IMS, such as complexity, systems, stakeholder theories and management theories. Some of the pertinent factors in this chapter, for example policy, employee performance and motivation which are the enablers for the IMS, were presented and discussed. The next chapter presents standardisation and combination as important stages for the IMS.

CHAPTER 3

STANDARDS AND COMBINATION

3.1 INTRODUCTION

This chapter begins with theories related to standards and combination. The researcher considers standards, standardisation and innovation as some of the factors. The researcher also discusses combination theories and related literature.

3.2 INSTITUTIONAL THEORY

Institutional theory attends to the deeper and more flexible aspects of the social structure. IMS has been shown to be a social system. This theory considers the processes by which structures, including schemas, rules, norms, and routines, become established as authoritative guidelines for social behaviour (Scott, 2003). Institutional theory was therefore used to analyse the deeper and more flexible aspects of an IMS, as reported in this chapter.

3.3 MANAGERIAL PHILOSOPHY

Managerial attitudes of organisations within international business contexts are a major concern while evaluating standardisation decisions of organisations. Jain (1989) proposes that organisations in which key managers share a common world view, as well as a common view of the critical tasks flowing from the strategy, are more effective in implementing a standardisation strategy. In other words, developing a shared managerial philosophy and using informal coordination mechanisms are associated with effective management of international integrative strategies. A single or shared managerial philosophy within the entire business unit would therefore support a global strategy, whereas a diverse or country-specific philosophy would give place to a multi-domestic strategy (Roth, Schweiger and Morrison, 1991). Since a single or shared managerial philosophy presents consistency of decisions in the context of geographical and cultural separation therefore, it would be appropriate to propose that a single or shared managerial philosophy provides an effective implementation of standardisation strategy (Roth & Schweiger, 1991).

3.4 SCIENTIFIC MANAGEMENT THEORY

Many of the current theories, concepts and tools relating to organisational and process efficiency and effectiveness trace their roots to the scientific management experts who worked on streamlining the way work was done. The pioneers in scientific management included such noted thinkers, writers and industry experts as Taylor (1911) and Gilbreth (1922). These experts attempted to provide answers to Urwick's question regarding the areas of organisation and coordination through their efforts to increase efficiency, productivity, and worker motivation.

Therefore, a scientific management approach for every concrete system means application of different methods and tools groups, which in concrete conditions result in best effects. This approach therefore capitalises on a culture of learning, as the approach must be modified before application in each organisation. Therefore, this approach could very well lead to the most ambitious level of integration, which would include the standardisation concept.

3.5 DIFFERENTIATING BETWEEN STANDARDS AND STANDARDISATION

According to Botzem and Dobusch (2012), standards are receiving increasing attention, particularly beyond the nation-state. Organisations use standards to ease transactions and to structure their internal affairs as well as the world around them. The ability of standards to structure inter-organisational relations makes them particularly suitable for research. Timmermans and Epstein (2010) state that standards are contested and volatile, and only become authoritative rules under certain conditions that need further specification: Standards transform by coordinating disparate elements, but the outcomes that standards achieve depend on the specific standards and the circumstances under which they are made to work. Furthermore, Burita and Zeman (2017) posit that the introduction of standards facilitates communication at all levels of the organisation, both between management and staff, and between the organisation and its customers.

Although there are variations in how the term 'standard' is defined, Burita and Zeman (2017) the following key common elements are included in multiple definitions by scholars and practitioners, namely that standards –

- have been established by consensus;
- have been approved by a recognised body;
- provide rules, guidelines or characteristics for activities or their results;

- are aimed at the achievement of order and coherence in technical or commercial activities, particularly to ensure that users have confidence that codified knowledge, materials, products, processes, and services, among others are fit for purpose (Allen & Sriram, 2000; Blind & Gauch, 2009; BSI, 2006; Ho & O'Sullivan, 2014; ISO, 2004).

Although studies define standardisation and standards differently, they rarely emphasise this distinction, while some studies treat the two terms synonymously. For example, Tassey (2000:588) explains, "standardisation represents a codification of an element of an industry's technology or simply some information relevant to the conduct of economic activity", while standards are a set of specifications to which all elements of products, processes, formats, or procedures under its jurisdiction must conform". These definitions assume that standardisation is a knowledge codification process, to assist understanding of the innovations and promote the efficiency of economic activity, especially in highly skilled settings (Bénézech, Lambert, Lanoux, Lerch & Loos-Baroin, 2001).

Therefore, standards are important factor when standardisation is being undertaken in organisation as it the foundation for addressing elements such as knowledge dissemination.

3.6 HIGHLIGHTING THE FIELDS OF RESEARCH ON STANDARDS

Despite recent interest in standardisation, standards are less of a novelty than might appear at first sight. They have been an object of analysis for some considerable time and in a number of disciplines. In technology studies and economics, the coordination and network effects of standards are widely discussed (David & Greenstein, 1990; Farrell & Saloner, 1986; Genschel, 1997; Werle & Iversen, 2006). Sociological approaches take an interest in the political and normative dimensions related to standard setting, including various modes of participation (Boli & Thomas, 1999; Hallström & Boström, 2010). Astonishingly, the various streams of literature make little reference to one another, missing opportunities for multi-disciplinary debate and learning. According to ISO (1996) standards are documents, established by consensus and approved by a recognised body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.

3.7 STANDARDS AND THEIR CONTRIBUTION TO INNOVATION

Standardisation is the pursuit of objectives through conformity, has a number of motivations, and is driven by a variety of innovation actors (Metcalfe & Miles, 1994; Tassey, 2000). The key difference between a standard and standardisation is that standardisation often occurs, at least

to a certain extent, and is sometimes inevitable, whether a standard is acknowledged or formally established or not. Standards (and standardisation) may have both positive and negative influences on innovation (Swann, 2000; Tassey, 2000). Despite their potential to constrain certain innovation activities, carefully constructed and implemented standards can create an infrastructure that support infrastructure that supports the transfer of innovative ideas, and hence facilitate innovation.

Three types of standards relate to the timing of standardisation with regard to innovation and market expansion: anticipatory standards, enabling standards and responsive standards (Egyedi & Sherif, 2010).

- Anticipatory standards apply to entirely new services and seek to resolve expected interoperability challenges.
- Enabling standards seek to reduce production costs in parallel with market growth.
- Responsive standards seek to improve efficiencies or reduce market uncertainties for auxiliary products and services.

These three types of standards are supposed to occur sequentially. Transitions to newer technologies occur after the market for a prevailing technology has been saturated (Egyedi & Sherif, 2010; Jakobs, Procter & Williams, 2001).

According to Egyedi and Sherif (2010), repetition of the sequence generates sequential innovation. With this in place standards and innovation will co-exists to improve efficiency in the organisation.

3.7.1 Managing innovation through standardisation

Standards may be accused of hindering innovation, but literature shows ample evidence of the opposite (e.g. Blind, 2013; Swann, 2005). It may be claimed that standardisation damages innovation (Ungan, 2006). Although standards can be critical in fostering technological innovation, particularly by supporting knowledge diffusion, their importance is often neglected by commonly used strategic frameworks. There is a long tradition of academic work (e.g. Brady, 1933) exploring the potential for standards to obstruct innovation by limiting technological variety. Hanseth, Monteiro and Hatling (1996), for example, argue that standards 'increase irreversibility and decreases interpretative flexibility of the technologies'. Standards may result in problems of a lock-in to inferior standards or the risks of monopoly, which are potentially detrimental to innovation (Swann, 2005). As Foray (1998) puts it, there are two apparently contradictory logics: that of freedom, creativity and dynamics related to innovation and that of stability, order and routine associated with standards. Recently, there has been a

growing understanding that standards, more generally, play critical roles in supporting various innovation activities. For example, in a bibliometric analysis, Choi, Lee and Sung (2011) demonstrate that well-designed standards support various innovation activities. A number of recent studies support these findings and suggest that standardisation performs important functions in support of innovation. They include:

- defining and establishing common foundations upon which innovative technology may be developed (National Science and Technology Council [NSTC], 2011);
- codifying and diffusing state of the art technology and best practice (Tassey, 2000);
- making them available as a basis for further innovation (Allen & Sriram, 2000; Hatto, 2010; Swann & Lambert, 2010); and
- allowing interoperability between and across products and systems, stimulating the diffusion and integration of new technologies into (product and service) systems (Blind & Gauch, 2009; Tassey, 2000).

Table 3.1: Standardisation and innovation in management research

Example	Dimension of knowledge embedded in a firm's standardisation effort	Types of innovation outcome
Tassey (2000)	High codification, high complexity	Modular/architectural/incremental radical
Kano (2000)	High or low codification, high complexity	Systematic/stand-alone
Tether, Hipp and Miles **(2001)**	High codification, high complexity	Service/process
Yoo, Lyytinen and Yang (2005)	High or low codification, high complexity	Diffusion/system/process
Rysmon and Simcoe (2008)	High codification, high complexity	Diffusion/cumulative
Leiponen (2008)	High or low codification, high complexity	No classification
Grotnes (2009)	High or low codification, high complexity	Outside-in/inside-out/couple process
Viardot (2010)	High or low codification, high complexity	Incremental/radical
Wright, Sturdy and Wylie (2012)	High codification, high or low complexity	Incremental/radical/management innovation
Narayanana and Chen (2012)	High or low codification, high complexity	Modular/architectural/incremental radical/process/product/institutional/industrial technological
Hytonen et al. (2013)	High or low codification, high complexity	No classification
Dolfsma and Seo (2013)	High codification, high complexity	Discrete/cumulative

Example	Dimension of knowledge embedded in a firm's standardisation effort	Types of innovation outcome
Gao et al. (2014)	High or low codification, high complexity	Diffusion/capability
Groesser (2014)	High or low codification, high complexity	Systems/diffusion/incremental
Lopez-Berosa and Gawer (2014)	High codification, high complexity	Collective innovation

Source: Xie, Hall, McCarthy Skitmore and Shen (2016)

In Table 3.1, the researcher presents the research on standardisation and innovation has employed two dimensions of knowledge to characterise the processes: codification and complexity. Codification refers to the extent to which knowledge can be documented, transferred or shared (Zack, 1999) and technological change (Anderson & Tushman, 1990) help explain how the level of knowledge codification can vary in standardisation. Non-codified knowledge usually emerges at earlier stages of standardisation when technological uncertainties, trials, and competition among various competing technologies are common. The early stage of a standardisation effort can end with the emergence of, for example, a dominant design (Anderson & Tushman, 1990) and the non-codified knowledge partially transforms to codified knowledge when the industry standard becomes established.

Innovations and standardisation are two facets of economic vitality and competitiveness (Viardo, Sherif & Chen, 2016). A common adage in the management community is that innovation is about creativity, while standardisation is about uniformity and that standardisation constrains entrepreneurship-seeking opportunities (Swann & Lambert, 2010). Furthermore, de facto standards could lead to monopoly power or at least market concentration. These raise costs for rivals, reduce choice for customers, and lock in old technologies (Viardot et al., 2016). In addition, badly conceived de jure standards could promote immature technologies. As a consequence of all these factors, some perceive innovation to be at loggerheads with standardisation (Viardot et al., 2016). In mediating and catalysing innovation: A framework for anticipating the standardisation needs of emerging technologies, Featherston, Jae-Yun, Hoj Brévignon-Dodin and O'Sullivan (2016) derived a theoretical framework to understand how a standard follows from an innovation. The framework explicitly characterises the alignment, coordination, and sequencing of innovation activities over time. Other important factors include the activities that require supporting standardisation, the different types of standards, the diversity of stakeholders and the timing of standard development.

Manders, DeVries and Blind (2016) examined the effect of the ISO 9001 standard for quality management on innovation. This standard is currently implemented by more than one million

organisations in 187 countries. Their thorough review of the existing data shows that the effect of ISO 9001 on product innovation is influenced by many factors, such as –

- the extent to which the standard has been adopted;
- the motivation behind the decision to conform to ISO 9001;
- the sector and the region within which an organisation operates;
- the size of the organisation; and
- the specific version of the standard that was adopted.

De Vries and Verhagen (2016) explored how energy performance standards can influence innovation in the Dutch construction sector. The sector they researched is known to be rather conservative and risk averse (De Vries & Verhagen, 2016). Their results indicated that standardisation triggers different forms of innovations in house design. Architects and construction organisations have resorted to systemic innovation using both process and organisational innovations to meet the regulations. In other words, government standards could foster innovations for achieving societal goals, in this case, reducing energy consumption.

Xie et al. (2016) focused on standardisation as a process of knowledge codification, knowledge transfer or recombination. In their article, “Standardization efforts: The relationship between knowledge dimensions, search processes and innovation outcomes”, they discuss the four types of search processes in standardisation: active, integrative, decentralised and passive. Knowledge codification fosters incremental and architectural innovations and, at the same time, hinders modular and radical innovations. The approach used in this article could open new avenues for further research better to understand the complex interaction between standardisation and innovation.

Wang and Kim (2007) explored the role of both standardisation and innovation for mass customisation. The proposed model was tested using data from 204 Chinese manufacturers and the outcomes provide intriguing insights. According to this analysis, most Chinese innovations are incremental. In this case, standardisation improves the assimilation of new information to enhance products and internal processes. The conclusion is that both innovation and standardisation, particularly organisation standards, are indispensable to achieve economies of scale without losing flexibility.

Featherston et al. (2016) provide an effective foresight framework for exploring the standardisation requirements of emerging technologies needs to account for the following critical strategic considerations and dimensions in appropriate detail.

- Time should be the underpinning principle, enabling the framework to reveal the dynamics of innovation and standardisation activities, including sequencing, interdependence, and the changing composition of stakeholders.
- Technological innovation activities should be identified in appropriate detail to reveal opportunities for standardisation, where relevant knowledge needs to be transferred, and where user requirements might be defined.
- Standards types should be identified in a comprehensive way to ensure that standards are developed in a form that is effective for knowledge transfer and diffusion.
- Standard development organisation (SDO) and participants should be identified for strategic coordination among stakeholders involved in standardisation activities.

Xie et al. (2016) refer to Figure 3.1 below.

- The first type of search and related innovation outcome occurs when the knowledge in a standardisation effort is of low complexity and is highly codified. This creates what we refer to as active search, and results in incremental innovation outcomes. Modular innovation means that the search is not centrally coordinated by a unit in the organisation.
- The second type of search and innovation outcome discuss occurs when the knowledge in a standardisation effort is highly complex and highly codified. This creates what we refer to as integrative search and results in radical innovation outcomes (Xie et al., 2016). By radical (Xie et al., 2016) meant that a situation where a firm takes whatever information comes its way, which can result in knowledge discovery and transfer efficiencies. However, the potential to receive novel ideas that underlie major solutions tends to be reduced by simply waiting for knowledge to arrive. This is because passive search has inertia and is satisficing in nature, i.e. once an organisation has received information to meet its requirements, waiting for further and better alternatives is considered time-consuming.

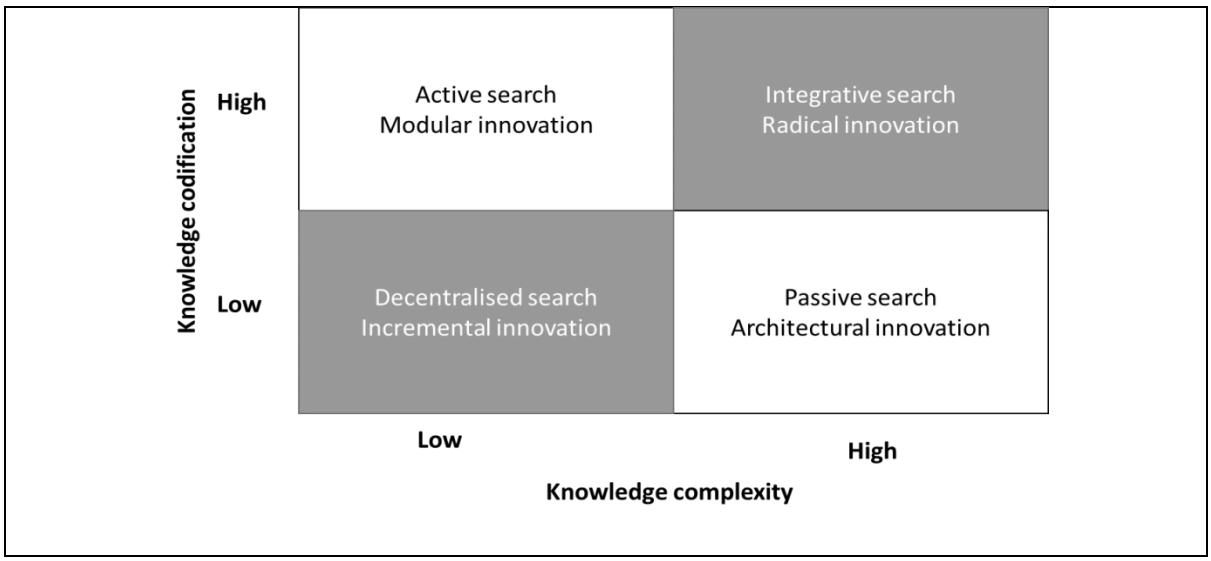

Figure 3.1: Standardisation effort and embedded knowledge dimensions: a typology of search processes and innovation outcomes

Source: Xie et al. (2016)

- The third type of search and innovation outcome in our typology refers to the knowledge dimensions that have low complexity and low codification. This results in an decentralised search and incremental innovation. In contrast to passive search, active search involves allocating resources vigorously to explore, test and shape the environment (Daft & Weick:1984). An active search includes sending agents to places and events in the environment (Smith, 2010) and engaging in trial and error learning (Daft & Weick, 1984). This type of search suits low complexity knowledge as it exists independently outside a firm's boundary and requires little integration with the firm's existing knowledge (Beckert, 1999).
- The final search type and innovation outcome in the typology is an passive search and architectural innovations, which involves embedded knowledge with high complexity and low codification. The search is passive because it employs and builds on the decentralised, radical and active search types. Integrative search toggles between these different search processes to produce both explorative and exploitative learning (McCarthy & Gordon, 2011). It is suited to environments where the regulations, demand, innovation and competitive actions in the industry are all changing at different rates and in different directions. This is considered to be a 'conflicted' industry dynamic that is unlikely to suit just one type of search process (McCarthy & Gordon, 2011).

Featherston et al. (2016) suggest that standards not only support information and knowledge diffusion, but also help mediate between innovation activities and between actors. This supports standards as a mechanism for aligning and coordinating innovation activities. Tassey

(2000) asserts that a number of activities already taking place are enhanced by standards, providing examples such as allowing factories to achieve economies of scale and enabled markets to execute transactions in an equitable and efficient manner. This enhancement can occur in a number of areas, including making these activities cheaper, easier, and faster. For example, the terminology and semantics standards developed for synthetic biology (the development of these rules is itself an innovation activity) enable communication between researchers, developers, and designers, catalysing renewed activity based on the flow of new information and knowledge. These functions (diffusion, mediation, enhancement, and catalysis) are important functions standards can play in supporting technology emergence. This supports the view that standards are enablers of information and knowledge diffusion and help to bridge the gap between research and markets (Blind & Gauch, 2009; EC, 2011).

3.8 STANDARDISATION

Standardisation is the process of reaching an agreement on technical and business specifications to be used consistently across a multinational company (MNC) (Markus, Tanis & Van Fenema, 2000). After standards have become de facto rules, they may still prevail when their input legitimacy is questioned. While the relationship of input and output legitimacy should not be conceptualised as one of juxtaposition, there are indications of a trade-off between the different modes. As Hallström and Boström (2010) show, particularly in multi-stakeholder arrangements, there is the potential for conflict between input legitimacy and output legitimacy, pointing to the importance of actor constellations, the availability of resources, and development over time. This also confirms the recursiveness of standardisation, in particular the recurrent adaptation or even re-formulation of standards. A dynamic perspective with regard to both standard setting and dissemination allows the researcher to detect alterations in the power relations of actors engaged in standardisation. Consequently, standardisation should be understood as an organised and potentially infinite process of sequences of standard formation and diffusion (Lampland & Star, 2009).

Isomorphic pressures, lead to the standardisation of procedures used and actors involved in standard-setting processes. What is not clear, however, is to what extent this meta-standardisation increases the chances for the convergence of national with transnational standards (Thiemann, 2014). In the context of organisational systems, standardisation is the process of reaching an agreement on technical and business specifications to be used consistently across an organisation (Münstermann, Eckhardt & Weitzel, 2010). Furthermore, Saltzman Chatterjee and Raman (2008) refer to standardisation as a voluntary process for developing specifications based on the consensus of organisations with their stakeholders.

Standardisation can be investigated at different levels (David & Rothwell, 1996; Perera, Nagarur & Tabucanon, 1999; Tamura, 2013).

3.8.1 Meta-standardisation

According to Botzem and Dobusch (2012), accounting standardisation can be analysed as involving three distinct dimensions: “formal rules, rule-setting procedures, and the actors involved”. The interplay between these three dimensions, the fit between standards, standard-setting procedures, and standard-setters can produce institutional complementarities, which support the perceived legitimacy of an acceptance of the standards developed. National standard-setting bodies and the national polities they represent seek to influence the standards formulated on the transnational level, as they are increasingly subjected to these rules (Botzem & Dobusch 2012). This puts national institutional configurations of standard setting under isomorphic pressure, as they seek to gain legitimacy in the eyes of focal transnational standard-setting bodies in order to increase their capacity for influencing decisions at the transnational level (Büthe & Mattli, 2011). In this way, a specific transnational form of private standard setting, concerning actors involved and procedures employed imposes itself on the national level, a trend called meta-standardisation (Botzem, 2012).

3.8.2 Standardisation effort

Standardisation is the process of developing and implementing specifications based on the consensus of the views of firms, users, interest groups and governments (Saltzman et al., 2008; Sherif, 2006). Standardisation can be led by a SDO, such as the American Society of Mechanical Engineers (ASME) that oversees standards for mechanical components and devices. It can also be led by individual firms pursuing a standard for their products or processes and related innovations. This is called a standardisation effort. The resulting standards are intended to promote compatibility, interoperability and quality. An early example of standardisation is the regulation of the sizes of the threads that we find on nuts, bolts and screws, which was achieved by the development of a screw-cutting lathe that could repeatedly produce these products to specific standards with universal applications. Standards can be developed and governed by SDOs or independently, for example, by firms who have a first mover or dominant position in the market (Utterback, 1996). When a firm pursues a standard to produce an innovation outcome, this is what is called a standardisation effort. For example, Google followed a standardisation effort when acquiring and developing the innovations for its mobile operating system, Android (Grotnes, 2009).

3.8.3 Process standardisation

Starting with a definition of 'business process' as the object to be standardised, one of the most common definitions given by Davenport and Short (1990) is highlighted. They define a business process as a "set of logically related tasks performed to achieve a defined business outcome". One possible level to increase the performance of a given business process is 'process standardisation'. Process standardisation is receiving increased academic and practitioner attention (Muenstermann, Eckhardt & Weitzel, 2010). In addition, Venkatesh (2006), for example, identifies 'process standardisation' as one of three "broad future research directions". An impressive number of recently published articles on process standardisation show the associated relevance (Muenstermann & Weitzel, 2008). From a practitioner perspective, attention is largely aimed at huge cost-saving opportunities through process standardisation, as a recent *Computer Weekly* headline (Hadfield, 2007) impressively illustrates by saying, "BP Retail expects to save up to £600m over the next few years by standardizing business processes and IT systems at all of its petrol stations around the world".

3.8.4 Process standardisation improves business performance

However, besides cost savings, process standardisation as a tool of business process management (BPM) could offer further value. Swaminathan (2001) demonstrates, "better operative process performance through business process standardisation" and argues further, "process standardisation provides immense benefits". Ramakumar and Cooper (2004) declare, "process standardisation proves profitable" while Wuellenweber, Beimborn, Weitzel and Koenig (2008) suggest that process standardisation also increases transparency and controllability. Common business processes and data standards are prerequisites for seamless transactions and information exchange across an organisation (Sethi, Sethi, Jeyaraj & Duffy, 2008). However, conflicts often arise between local and organisation-wide requirements during process standardisation. Many organisations are still struggling to streamline the flow of business processes and data across their subsidiaries.

Although business process standardisation offers convincing benefits, having diversity in business processes allows different kinds of customers to be served in different ways. "In a process organisation, the key structuration issue is no longer centralisation versus decentralisation – it's process standardisation versus process diversity" (Hammer & Stanton 1999). Business process standardisation provides a positive effect business value by enhancing process performance and market success (Muenstermann, Eckardt & Weitzel, 2009a; Fomin & Lyytinen, 2000; Lee & Kim, 1997; Swaminathan, 2001). A positive effect of process standardisation occurs primarily on business process time (Manrodt & Vitasek, 2004),

business process costs (e.g. Beimborn, Gleisner, Joachim & Hackethal, 2009; Sánchez-Rodríguez, Hemsworth, Martínez-Lorente & Clavel, 2006), and business process quality (Ramakumar & Cooper, 2004). A linkage has also been drawn between business process standardisation and enhanced process flexibility (Muenstermann & Weitzel, 2008; Ross, 2003).

This multitude of research findings resulted in the widely-accepted proposition that business process standardisation has a positive effect business process performance. However, apart from this common assumption, there is little reliable knowledge about why and how business process standardisation can provide these benefits. First approaches suggest that an increased process performance might be the result of the combined use of data and process standards (Muenstermann, Eckhardt, Weitzel, 2009b) and that the corporate implementation of process standardisation projects is driven by top management support, involvement of all affected departments as well as by the organisational topology (Muenstermann & Eckhardt, 2009).

3.9 ANNEX SL

Annex SL is a high-level structure for all ISO management system standards. Whilst the high-level structure cannot be changed, sub-clauses and discipline-specific text can be added.

In Table 3.2 the researcher indicates the high-level structure of Annex SL.

Table 3.2: Annex SL high-level structure

Clause 1	**Scope**
Clause 2:	Normative references
Clause 3:	Terms and definitions
Clause 4:	Context of the organisation
Clause 5:	Leadership
Clause 6:	Planning
Clause 7:	Support
Clause 8:	Operation
Clause 9:	Performance evaluation
Clause 10:	Improvement

Source: ISO 9001 (2015)

Annex SL applies to all management system standards, such as full ISO standards, publicly available specifications (PAS) and technical specifications (TSp).

Frameworks introduce standards used in each area (Novotny, 2006). Defined standards are designed to provide a clear definition of each business process for simplification of

communication within the organisation and organisation communication with its surroundings. Standards may define requirements for the formats used and their processing procedures, data structures and data exchange. Defined standards not only enable efficient management of the entire organisation as well as planning its future activities (Novotny, 2006). The probably most common definition has been given by ISO (1996): “standards are documents, established by consensus and approved by a recognised body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context. Standards can affect economic efficiency positively and negatively” (Tassey, 2000:595). As for the negative effect of standards, it has been shown that historical events are more important than an economic perspective, and standards can produce “lock-in effects” (Arthur, 1989:120). Therefore, from the theory, the following hypothesis was tested:

H_0^7 There is no relationship between organisational efficiency and standards.

H_7 There is a relationship between organisational efficiency and standards.

In hypothesis 7, ‘organisational efficiency’ was considered to be the independent variable, and ‘standards’ was the dependent variable. The null hypothesis was that the relationship between organisational efficiency and standards is zero. The alternative was that there is a relationship between standards and innovation.

3.10 BUSINESS PROCESS COMPLEXITY VERSUS STANDARDISATION

A business process needs a specific level of complexity to be able to cope with the complexity of its environment (e.g. Flood & Carson, 1993; Jackson, 2003). Business process complexity is related to the difficulty, uncertainty, and inter-dependence associated with the activities of a business process (Karimi, Somers & Bhattacherjee, 2007). Complex business processes have high task variety and low analysability (Mani, Barua & Whinston, 2010). With increasing complexity, more information must be processed in order to monitor and assure the quality of business processes (Fredendall, Craig, Fowler & Damali, 2009; Melville & Ramirez, 2008). If process activities are uncertain and highly interdependent, this will increase the complexity of the business process. This means that process managers or operators will be confronted with high uncertainty, high variety, and interdependence of the process activities (Karimi et al., 2007; Mani et al., 2010). The more complex a business process is, the higher the effort needed will be. The nature and characteristics of an individual business process allow assigning it to one of the three types proposed by Lillrank (2003): standard, routine, and non-routine (see Table 3.3). The main difference between the types is that each of them belongs to another

level of business process complexity: a standard process represents the lowest level of complexity, whereas a non-routine process exhibits the highest level.

Table 3.3: Characteristics of standard, routine and non-routine processes

	Standard	**Routine**	**Non-routine**
Acceptance criteria	Single variety	Bounded variety set	Open input set
Assessment	Acceptance test	Classification	Interpretation
Conversation rules	Switch algorithm	Algorithm, grammar, habit	Heuristics
Repetition	Identical	Similar but not identical	Non-repetitive
Logic	Binary	Fuzzy	Interpretative

Source: Lillrank (2003)

To discuss Table 3.3, the input of a routine process must be interpreted and classified before a finite set of actions and algorithms can be selected (Lillrank, 2003; Lillrank & Liukko, 2004). The goal is usually clear, but can be achieved through different actions because of the variety in the sequence of events or actions (Pentland, 2003). A non-routine process is characterised by a vague or unknown set of inputs and outputs (Lillrank & Liukko, 2004). The unknown input cannot be directly linked to specific actions or algorithms. The variety of the input set is larger than the experience set employed by the process (Lillrank, 2003). This uncertainty of inputs may only be dealt with by highly skilled or experienced employees (experts) who develop new knowledge and heuristics while executing the process. Standardisation may therefore not be feasible if the environmental complexity faced by the business process is high and cannot be reduced. Then the business process needs to mirror this high environmental complexity, which contradicts standardisation (Lillrank, 2003). Referring to Lillrank's (2003) classification, the conclusion that the higher the complexity of a given business process, the lower the resulting standardisation process.

3.11 IMPROVING PERFORMANCE THROUGH STANDARDISATION

Besides the traditional concern with clinical judgment and social desirability, various investigators (see Anderson, 1971) have considered judgments about motivation, ability, obligation and responsibility, pride and shame, and many others. A central theme of the integration theoretical approach is the search for a cognitive algebra. Simple algebraic models have been found to operate in judgmental processes over a wide range of stimulus situations, from person perception and attitude change to decision-making and psychophysics. Heider (1958) suggests that judgments of performance should follow a multiplying model: performance = motivation X ability.

Business process improvement continues to be on the agenda of top management worldwide (GartnerGroup 2010; Luftman & Zadeh, 2011). It is generally accepted that BPM can significantly improve an organisation's performance (Kettinger & Teng, 1997; Reijers & Liman Mansar, 2005). Business process standardisation is an often-discussed approach to increase business process performance (Davenport, 2005; Hammer & Stanton, 1999) and refers to using standard parts and standard operating procedures for process activities, both of which remove operator discretion, ambiguity, and opportunities for making mistakes (Anupindi, Chopra, Deshmukh, Van Mieghem & Zemel, 2006). The standardisation of business processes enables organisations to decrease flow times, lower inventories, and achieve higher throughput (Anupindi et al., 2006). Often-mentioned benefits include cost savings and an increase in profits due to higher efficiency, decreasing risks, and improved transparency, controllability, and quality (Muenstermann et al., 2010; Ramakumar & Cooper, 2004; Thawani, 2004; Wullenweber et al., 2008).

3.12 STANDARDISATION DEBATES

Nasir and Altinbasak (2009) state that in the last four decades, a great amount of academic research has been devoted to standardisation debates. During the 1980s, mainstream articles on this topic concentrated on whether an organisation should follow a strategy of adaptation to each national market versus standardisation across all national markets (Levitt, 1983). It has been discussed that as the similarity of the markets increased and markets became homogenised, an organisation could market similar products and services around the world with standardised marketing programs (Hamel & Prahalad, 1985; Levitt, 1983). However, this view has received criticism and it is argued that cultural, political and economic differences between nations have been underestimated thus throwing into question the feasibility of standardisation (Quelch & Hoff, 1986). On the other hand, another group of researchers has been united around the contingency approach, which focused on the degree of desired and feasible standardisation (Jain, 1989; Rau & Preble, 1987; Walters, 1986).

The benefits and challenges of standardisation have captured the attention of managers and scholars, yet the empirical findings on the influence of standardisation on innovation are inconsistent. Focusing on a standardisation effort (i.e. when a firm pursues standards to further innovation), studies draw upon on research on the importance of search processes for innovation and adopt a contingency approach to the standardisation effort, search process and innovation outcome relationships. An important implication is that standardisation efforts need to be seen as a long-term strategic initiative that drives the creation and adoption of standards and innovations. If the search processes and resulting standards are not coordinated in pursuit

of an innovation goal, then the risk is that the effort will be a collection of disconnected standardisation exercises that result in bureaucratic inefficiencies, commoditisation or the stifling of creativity.

It is accepted that not all standards are developed through formal standardisation processes (Allen & Sriram, 2000; Metcalfe & Miles, 1994; Tassey, 2000; Wang & Kim, 2007). However, attempts to anticipate the standardisation needs of emerging technologies are, of course, challenging. This is partly because of the non-linear, highly complex, and highly uncertain nature of innovation. A further reason is that standardisation processes are complex and dynamic, involving –

- high levels of technical detail and consensus;
- various types of standards in terms of both their role and the developing organisations;
- different motivations and requirements from stakeholders; and
- the integration of information relevant for standards development, which is distributed among a variety of innovation system actors (Allen & Sriram, 2000; Blind & Gauch, 2009; Swann & Lambert, 2010; Tassey, 2000; Wang & Kim, 2007).

Furthermore, given this complexity, there is significant potential for competing standards visions or premature consensus to emerge, leading to ineffective or even counterproductive standards (Foray, 1998; Swann & Lambert, 2010; Tassey, 2000).

3.13 STANDARDISATION AND STANDARDISATION EFFORT

A business process is generally understood to be a sequence of actions, carried out by actors or information technology (IT), by which organisations transform inputs into outputs (Lillrank 2003). Business processes cut horizontally across the organisation and create an interrelated organisational subsystem that forms a micro-structure of related tasks, technology, and people (Kettinger & Teng, 1997). “Therefore, business processes cover a wide range of activities within an organisation. The spectrum ranges from iterative and simple to creative, or knowledge-intensive, and unique business processes” (Anupindi et al., 2006). The main challenge during standardisation initiatives is to turn existing process variants into standard operating procedures that are obligatory to all actors in an organisation (Lillrank & Liukko 2004). This is an organisational effort directed towards standardising appropriate business processes. Relating standardisation effort to the likelihood of standards, given specific sources of and specific levels of process variability, we expect that the more resources we invest in standardisation, the more standardisation we will achieve (Anupindi et al., 2006).

H_0^8 There is no relationship between standardisation effort and standards.

H_8 There is a relationship between standardisation effort and standards.

In hypothesis 8, ‘standardisation effort’ is considered to be the independent variable, and ‘standards’ is the dependent variable. The null hypothesis was that the relationship between standardisation effort and standards is zero. The alternative was that there is a relationship between standardisation effort and standards.

Therefore, standardisation is not a management lever that guarantees or enables standardisation in each and every case. Process managers should be aware that investing more resources in standardisation initiatives in order to standardise unstandardisable, complex processes will not be successful. Moreover, complex processes may often well be combinations of sub-processes that are standard, routine, or non-routine (Lillrank, 2003). For example, business processes that involve creativity are not simply either creative or noncreative, but often combine creative parts (i.e. “pockets of creativity” that cannot be standardised) as well as noncreative parts (i.e. that can be standardised) (Seidel et al., 2010).

Which parts can be standardised? Attempts to manage the whole business process as if it were of one single type will create obvious problems (Lillrank 2003). This also might help to provide new perspectives on other BPM-related issues, for example, research on enterprise resource planning (ERP) implementation failures (e.g. Karimi et al., 2007). Such approaches and tools do not have to target increases in efficiency. For example, context-dependent decision support tools mechanisms for enhancing creativity (Seidel, 2011) offer BPM instruments that are not related to standardisation. To sum up, if the reduction of complexity for certain process parts is not an option because of market conditions and resulting process-inherent characteristics, enhancing the standardisation effort to leverage advantages of standardisation will be a good choice.

3.14 COMBINATION

The next section presents combination as an integral part of IMS.

3.14.1 Combination theorists

Joseph Alois Schumpeter’s (theory of economic development) has rightly been praised as a major contribution to economic theory (Kurtz, 2012). Some of the most famous concepts commonly associated with the name of Schumpeter, such as the one of “new combinations”, can be traced back to Marx. Interestingly, prior to Schumpeter (1934) had been concerned with refuting the socialist attack on capitalism and therefore it comes as a surprise how little

the analyses of the two comrades in arms had in common (Kurtz, 2012). Entrepreneurial resource combination is widely recognised as a key enabling factor to the survival and growth of a new venture, but how and why resources are integrated, remain elusive (Peng, Liu & Lin, 2015).

3.14.2 A combination strategy for improving performance

Parnell and Hershey (2005) undertook research that considered the viability of the combination strategy with regard to the Porter (1979) and Miles and Snow (1978) generic strategy typologies. Within each framework, it was found that it is possible to pursue a combination strategy, whereby dimensions of two or more pure strategies are incorporated simultaneously. The research presents findings from an assessment of perceptions of 4I5 American and Mexican managers regarding their firms' strategies and levels of performance. The data suggests that combination strategies can be associated with either inferior or superior performance.

According to Parnell and Hershey (2005), the issue of combination strategy viability whether or not dimensions from two or more 'pure' strategies can be combined and effectively implemented-has been widely debated, but not resolved. This lack of resolution can be traced to fundamental differences in the competing industry- or resource-based perspectives on strategy and the application of strategy typologies based on those perspectives. According to Porter's framework (see Parnell and Hershey, 2005), a business can maximise performance either by striving to be the low-cost producer in an industry or by differentiating its line of products or services from those of other businesses. Either of these two approaches can be accompanied by a focus of organisational efforts on a given segment of the market. Miles and Snow's (1978) framework identified four strategic types: prospectors, defenders, analysers and reactors.

- Prospectors perceive a dynamic, uncertain environment. They maintain flexibility and employ innovation to combat environmental change, often becoming the industry designers.
- In contrast, defenders perceive the environment to be stable and certain and thus seek stability and control in their operations to achieve maximum efficiency.
- Analysers stress both stability and flexibility attempting to capitalise on the best of both of the preceding strategic types.
- Reactors lack consistency in strategic choice and perform poorly.

Business strategy typologies identifying several generic strategic approaches were developed and utilised as a theoretical basis for identifying strategic groups in industries. Although strategic groups are an industry-specific phenomenon, many strategic group researchers began to utilise approaches believed to be generalisable across industries, specifically those proposed by Porter (1980) and by Miles and Snow (1978; 1986).

Parnell and Hershey (2005) continued to research the relationship between strategy and performance. Some studies concluded that only 'pure' strategies (i.e. cost minimisation or differentiation) were associated with superior performance. These studies embraced Porter's (1980) original contention that viable business units must seek either a low cost or a differentiation strategy to be successful (Dess & Davis, 1984; Hambrick, 1981). For example, Dess and Davis (1984) examined 19 industrial products businesses and suggested that superior performance was achieved through the adoption of a single strategy. Similar results were found in Hambrick's (1983) investigation of capital goods producers and industrial product manufacturers.

Parnell and Hershey (2005) posit that most studies defending the single strategy position have identified clear strategic groups, each with its own association with performance. Other studies found that combination strategies (i.e. low cost and differentiation) were optimal. Researchers in this group considered the combination strategy to be viable over the long-run, and in many cases, to be associated with superior performance (Hill, 1988; Parnell & Wright, 1993). It is this second group of studies that provides the operational support of the concept of the combination strategy (Parnell & Hershey, 2005).

Therefore, it can be summarised that the research by Parnell and Hershey (2005) supports the notion that combination strategies may lead to superior performance, but can actually reduce satisfaction with performance when the various dimensions of the strategy are inconsistent. The implications for practitioners are clear. Strategic managers should develop a clear, internally consistent strategy for the firm. Delivering value to customers via the combination strategy can be an effective strategic choice (Parnell & Hershey, 2005).

3.14.3 Statistical combination modelling

Feng, LI, Gao and Hua (2012) propose a combination model (see Figure 3.2) to estimate operational risk.

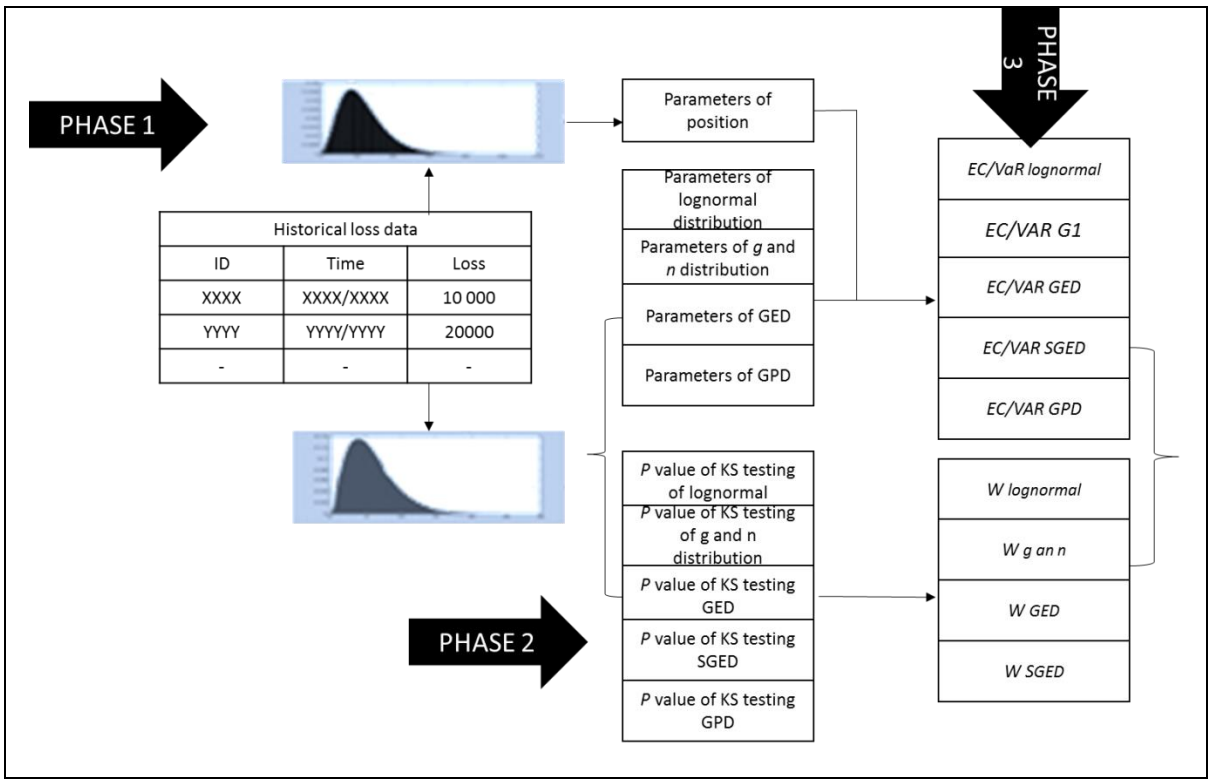

Figure 3.2: Statistical combination modelling for operational risk estimation

Source: Feng et al. (2012)

The model has three stages as described below by (Feng et al. 2012).

- First, the researchers estimated operational risk by using different heavy-tailed distributions in the loss distribution approach framework.
- Secondly, the weights are decided according to certain criteria, and the, p-values of the Kolmogorov-Smirnov goodness-of-fit test are used to decide the weight of each operational risk.
- Finally, the results obtained in the previous phases are combined in an integrated estimation to form the final result.

Feng et al. (2012), the combination model can integrate characteristics of different heavy-tailed distributions and can reduce uncertainty of operational risk. Furthermore, Feng et al. (2012), the combination model allows capital to be allocated in a more efficient way than the standard approach (where only one heavy-tailed distribution is used).

3.14.4 The mediating effect of environmental uncertainty and entrepreneurial resource combination

Borrowing from the theory of resource combination proposed by Sirmon, Hitt and Ireland (2007), empirically examined how environmental uncertainty influenced entrepreneurial resource combination. Furthermore, Sirmon et al. (2007) examined the mediating effect of effectual flexibility on the relationship between environmental uncertainty and entrepreneurial resource combination to see how new ventures utilise flexibility to neutralise the threat of environmental uncertainty.

Peng et al. (2015) examined data from 287 new ventures, and found that both environmental dynamism and environmental hostility have significant positive influence on entrepreneurial resource combination (including entrepreneurial resource cohesion and entrepreneurial resource coupling). 'Entrepreneurial resource cohesion' is defined as the combination of similar resources, such as technology integration, finance integration and HR integration, while 'entrepreneurial resource coupling' is defined as the combination of different kinds of resources, such as the combination of technology and human resources.

Peng et al. (2015) found that flexibility mediates the relationship between environmental uncertainty (including environmental dynamism and environmental hostility) and entrepreneurial resource combination. Empirical studies (see Black and Boal, 1994 Sirmon et al., 2007) also show that entrepreneurial self-efficacy positively moderates the relationship between environmental dynamism and flexibility, but negatively moderates the relationship between environmental hostility and flexibility.

Sirmon et al. (2007) propose that a firm should choose a suitable way to combine resources under situations of high environmental uncertainty. However, a suitable way to combine resources is still undefined. Specifically, no research discriminates between the combination of similar resources and the combination of different resources. Black and Boal (1994) state that, while combining similar resources needs more correlative knowledge of those resources, combining different resources needs more systems knowledge. Applying theories from software engineering, Peng et al.'s (2015), article divides entrepreneurial resource combination into entrepreneurial resource cohesion and entrepreneurial resource coupling to contribute to the literature on resource combination, and adds to the understanding of this issue.

3.14.5 A discussion of entrepreneurial resource combination

According to Sirmon, Gove and Hitt (2008), new ventures cannot only acquire leading advantages in a domain through entrepreneurial resource cohesion but they should also acquire resource configuration advantages through entrepreneurial resource coupled by identifying and selecting and integrating different kinds of resources. In a stable environment, new ventures can sustain long-term competitive advantages with the capabilities they have at hand. Therefore, there is no need to create new capabilities through entrepreneurial resource combination (Chandler, DeTienne, McKelvie & Mumford, 2011). In a highly dynamic environment, however, it becomes difficult for new ventures to maintain sustainable competitive advantages with resources at hand. New ventures need to develop new capabilities through entrepreneurial resource cohesion and coupling to cope with external competition (Chandler et al., 2011). While entrepreneurial resource cohesion leads to a combination of similar resources to form new capabilities that competitors cannot imitate, entrepreneurial resource coupling combines different kinds of resources in a wider range to create more new resource portfolios (Chandler et al., 2011). These new resource portfolios form the basis of new configuration capabilities. Hence, Peng, Chen and Liu (2015) posit that environmental dynamism is an important antecedent of entrepreneurial resource combination.

Flexibility allows new firms to embrace exogenous changes as opportunities (Chandler et al., 2011). New ventures which combine resources in a flexible way to exploit opportunities continuously will strengthen entrepreneurial resource cohesion and entrepreneurial resource coupling. Additionally, entrepreneurs who are flexible tend to abandon less effective resource combinations, and restart combination activities. The recombination of resources increases entrepreneurial resource cohesion and entrepreneurial resource coupling as well. Therefore, Peng et al. (2015) posit that flexibility is the mechanism through which environmental uncertainty positively affects entrepreneurial resource combination.

3.14.6 Creative combination

Little is known about firms disappearing, not through failure, but rather by business combination (Borchert & Cardozo, 2010).

Creative combination may suit not only emerging firms, but also existing businesses, for whom obtaining the unique resource through merger or acquisition may be more economical than attempting to develop a comparable resource internally. If stakeholders in the start-up cannot fulfil all the conditions noted above, the performance of the firm suffers, and while it might survive at some level (DeTiene, Shepherd & DeCastro, 2007), it is unable to displace the

incumbent. If this occurs, then combining the novel resource with an existing business offers a viable alternative, which we call creative combination. We define “creative combination” in this context as the merging of a young business with an existing business. Creative combination thus forms a subset of all mergers or acquisitions, many of which take place among long-established businesses. The research by Borchert and Cardozo (2010) sought to explain the disappearance of firms through “creative combination”, which involves the merger of an emerging firm with an established one, giving the emerging firm access to resources and enabling the established firm to adapt to technological and other changes rather than to be forced out through creative destruction. The researchers reviewed records of more than 18 000 business incorporations and explicit discontinuances in Minnesota from 1900 to 2000 which showed that more than one in four firms in their population chose business combination (merger) as a route of exit. Firms disappearing through business combination had shorter lives, and tended to merge during eras of greater resources slightly more often than during eras of resources constraints (Borchert & Cardozo, 2010). This leads to the counter-intuitive suggestion to business owners to consider combining resources with another firm when times are good.

Schumpeter’s (1942) theory of creative destruction underlies current thinking on the disappearance of businesses (Borchert & Cardozo, 2010). Schumpeter believed that start-up firms using new technology (including new products, production or delivery processes) would displace existing businesses that used old technology. In terms of the resource-based theory of the firm (Lippman & Rumelt, 1982), the availability of a unique (or not readily imitable) resource would enable the start-up firm to displace the established firm. As the new firm exploits its strategic assets, it must either find new customers or displace an existing firm by providing additional utility to the incumbent firm's customers. For displacement to occur, several assumptions embedded in Schumpeter’s concept must all be satisfied (Borchert & Cardozo, 2010). First, stakeholders in the start-up firm must desire to form and operate a business on a long-term basis. Secondly, they must be able to assemble the complementary resources (human, financial, physical and organisational) (Peteraf, 1993) in a timely fashion to create a viable business. Thirdly, the start-up firm must deploy those resources strategically to create and sustain a competitive advantage sufficient to drive the established firm(s) from part of or the entire marketplace. Fourthly, established firms must be unwilling or unable to obtain a resource comparable to that available to the start-up firm, or to defend their market positions in some other manner (Borchert & Cardozo, 2010).

To conclude, the relations used in combination theory are non-trivial structures that cannot be captured by a simple taxonomic approach (Borchert & Cardozo, 2010). Therefore, the theory suggests that there is merit in both (leadership and management) accounts of combination.

3.15 CONCEPTUAL FRAMEWORK

According to Robson (1993), developing a conceptual framework forces the researcher to be explicit about what he or she thinks he or she is doing. The researcher identifies what to select and to decide which are the important features, which relationships are likely to be of importance or meaning, and hence, which data the researcher is going to collect and analyse. Additionally, Blaxter, Hughes and Tight (1996) explain the components of conceptual frameworks as defining the key concepts and contexts of the research project should also assist the researcher in focusing his or her work. Blaxter et al. (1996) define the territory for research, they indicate the literature the researcher needs to consult and suggest the methods and theories the researcher might apply. Using different terminology, Maxwell (1996) nonetheless complements Blaxter et al. (1996) by suggesting, “Conceptual frameworks are the system of concepts, assumptions, expectations, beliefs and theories that supports and informs [the] research”. A concept map, like the theory it represents, is a picture of the territory the researcher wants to research, not of the research itself (Leshem & Trafford, 2007). It is a visual display of your current working theory, or a picture of what you think is going on with the phenomenon you are researching.

Leshem and Trafford (2007) for instance, indicate that conceptual frameworks help researchers by:

- modelling relationships between theories;
- reducing theoretical data into statements or models;
- explicating theories that influence the research;
- providing theoretical bases to design, or interpret, research;
- creating theoretical links between extant research, current theories, research design, interpretations of findings; and
- conceptual framework conclusions.

Thus, conceptual frameworks introduce explicitness within research processes (Leshem and Trafford, 2007). Therefore, the conceptual framework for the current research presented in Figure 3.3 has drawn on literature from complexity theory, systems theory, management theory and shareholder theory as the foundation for literature development. Furthermore, other theories were also considered such as resource combination theory (Black & Boal, 1994),

Herzberg's (1966) two-factor theory, Maslow's (1943) theory of human motivation, Roberts and Handline (1975) decision theory and Anderson's (1971) information theory as contributing to the factors of the conceptual framework.

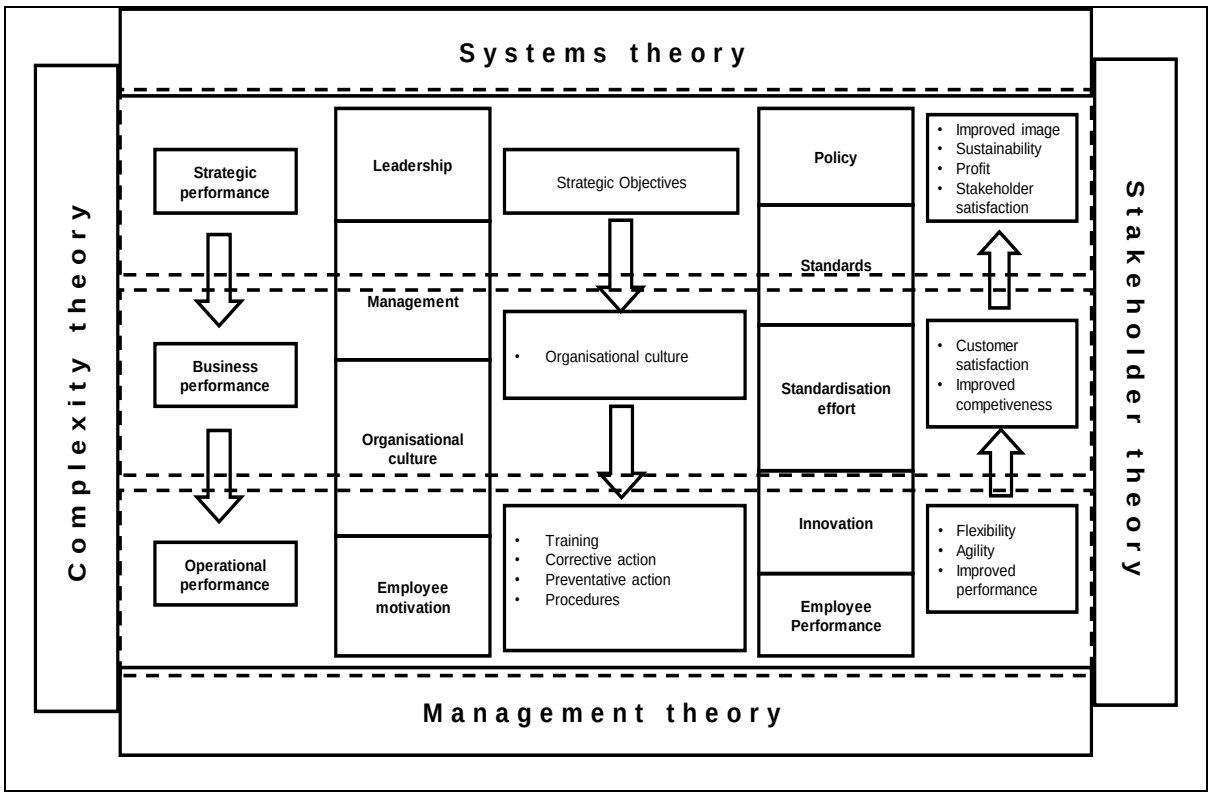

Figure 3.3: A conceptual framework for the integration of management systems

The initial review of literature began with an examination of publications that discussed the concept of an IMS and how this influenced organisations. These fields of research were identified through a search of scholarly literature available primarily through electronic databases. The review process was then narrowed down to publications that referred specifically to the factors of integration with respect to management systems. Some of the factors considered during the review were employee motivation, employee performance, organisational culture, leadership, management, policy, standards, standardisation effort and innovation. These key factors, related to an IMS, which emerged from the literature, were then synthesised to form the conceptual framework presented in Figure 3.3. Following that, the factors from the conceptual framework led to test the relationships between these factors. This allowed for the following hypotheses to be tested, as reflected in Figure 3.4.

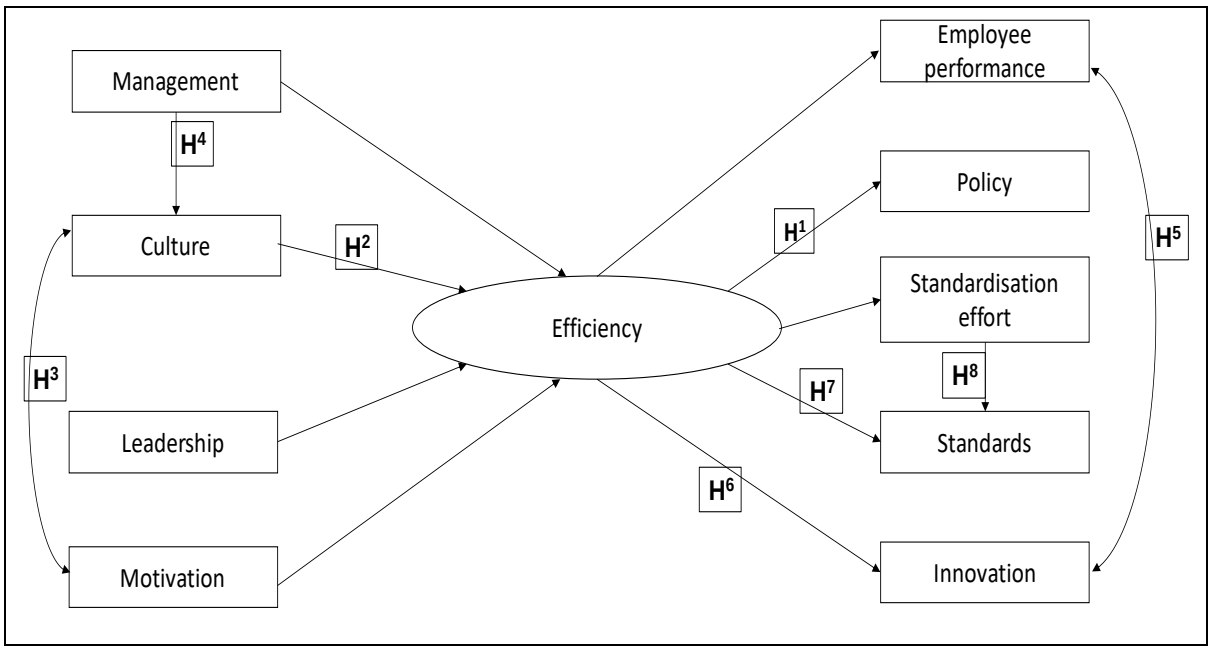

Figure 3.4: Research framework to test a hypothesis

Hypothesis 1

H_0^1 There is no relationship between organisational efficiency and policy.

H_1 There is a relationship between organisational efficiency and policy.

Hypothesis 2

H_0^2 There is no relationship between organisational culture and organisational efficiency.

H_2 There is a relationship between organisational culture and organisational efficiency.

Hypothesis 3

H_0^3 There is no relationship between organisational culture and employee motivation.

H_3 There is a relationship between organisational culture and employee motivation.

Hypothesis 4

H_0^4 There is no relationship between management and organisational culture.

H_4 There is a relationship between management and organisational culture.

Hypothesis 5

H_0^5 There is no relationship between employee performance and innovation.

H_0^5 There is a relationship between employee performance and innovation.

Hypothesis 6

H_0^6 There is no relationship between organisational efficiency and innovation.

H_6 There is a relationship between organisational efficiency and innovation.

Hypothesis 7

H_0^7 There is no relationship between organisational efficiency and standards.

H_7 There is a relationship between organisational efficiency and standards.

Hypothesis 8

H_0^8 There is no relationship between standardisation effort and standards.

H_8 There is a relationship between standardisation effort and standards.

The eight hypotheses are diagrammatically presented and reflect the causal relationships of the factors of an IMS. These were tested and the findings are discussed in Chapter 5 of the thesis.

3.16 CHAPTER SUMMARY

Standardisation is an important tool to advance organisations as it entrenches standards into an organisation. The literature presented enabling processes, such as standardisation effort and innovation as enablers for an IMS process. Combination was also discussed (see section 3.14) with key development theories and examples of implementation were deliberated. The chapter concluded with the presentation of the conceptual framework for the research and the structural equation model to test the relationships between the factors.

Finally, the research problem was that there is a poor understanding of an IMS and organisations need a better tool to integrate management systems. The literature review led to a series of hypotheses that intended to answer the research problem. The research problem and hypotheses informed the research methodology, which are discussed in the next chapter.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter presents a discussion of the methodology that was followed in order to address the research question and to test the hypotheses that were formulated after the extensive literature review. The research approach which is always based on the research question is the plan and structure of the research (Cooper & Schindler, 2003). The research question can be regarded as the foundation for successful question development. This research was conducted in stages (exploratory and then quantitative) as discussed further in this chapter (see 4.2.1).

4.2 RESEARCH APPROACH

According to Creswell (2014), research approaches are the plans and procedures for research that span the steps from broad norms to detailed methods of data gathering, analysis and elucidation. The conventional approaches are qualitative, quantitative and mixed methods.

The Table 4.1 below, adopted from Creswell (2014) describes the conventional research methods.

Table 4.1: Research methods

Quantitative methods	**Mixed methods**	**Qualitative methods**
Pre-determined	Both predetermined and emerging methods	Emerging methods
Instrument-based questions	Both open and closed-ended questions	Open-ended questions
Performance data, attitude data, observational data and census data	Multiple forms or data drawing on all possibilities	Interview data, observation data, document data and audio-visual data
Statistical analysis	Statistical and text analysis	Text and image analysis
Statistical interpretation	Interpretation across databases	Themes, patterns interpretation

Source: Creswell (2014)

4.2.1 Exploratory sequential mixed-methods design

According to Creswell (2014), the exploratory sequential mixed-methods approach is a design in which the researcher starts by exploring the qualitative data and analysis and then uses the findings in a second quantitative phase. Like the mixed methods approach, the second phase builds on the results of the initial phase. The intent of the approach is to develop better measurements with specific samples of populations and to see whether data from a few individuals (in the qualitative phase) can be generalised to a large sample of a population (in the quantitative phase). For example, the researcher would first collect focus group data, analyse the results, develop an instrument based on the results, and then administer it to a sample of a population. In this case, there may not be adequate instruments measuring the concepts in terms of the sample that the investigator wishes to research. In effect, the researcher employs a three-phase procedure with the first phase as exploratory, the second as instrument development, and the third as administering the instrument to a sample of a population (Creswell, 2014). The researcher followed this approach as it was best suited for the current research.

This research adopted firstly the qualitative approach and then the quantitative approach, as Creswell (2014) indicates that the qualitative approach involves exploring and appreciating the meanings individuals or groups attribute to a social or human problem. The research intended to measure the intangible, i.e. views and opinions of the cases which were regarded as abstract in nature. Tashakkori and Teddlie (2003) argue that various methods are useful if they provide improved opportunities for the researcher to answer his or her research questions and if they allow the researcher to evaluate the extent to which his or her research findings can be viewed as reliable and inferences made from them better. The exploratory sequential mixed methods design was intended to tap into the minds of individuals from management and employees and therefore mixed methods approach was considered most effective for this research.

4.3 RESEARCH PHILOSOPHY

According to Saunders, Lewis and Thornhill (2012), research philosophy relates to the development of knowledge and the nature of that knowledge. The research philosophy is a critical part of the methodology chapter as it has important assumptions about the manner in which the researcher views the world.

4.3.1 Ontology

Ontology is concerned with the philosophies about what there is to know about the world (Richie & Lewis, 2003). This research examined the integration of management systems and the type of methods organisations employ ontologically. The practice methods employed by organisations informed the new framework that was developed. This was achieved by understanding the views and opinions of senior management of organisations themselves through the analysis of the results of the semi-structured face-to-face interviews and the data from the research questionnaire.

4.3.2 Epistemology

According to Richie and Lewis (2003), epistemology deals with the researcher's ways of knowing and learning about the social realm, focusing on questions such as how reality can be known and what the foundation for knowledge is. This research, for example, through the understanding of leadership in organisations, suggests what the most effective management styles are. The interviews provided some understanding of the phenomena that guided the research.

Therefore, the research philosophy for this research follows the principle of positivism. Positivism is an epistemological view that advocates the application of the methods of the natural sciences to the study of social reality and beyond (Bryman, 2012). It should be noted that there is no one research philosophy that is better than the other but the choice of a research method is informed by the research question and is influenced by practical guidelines. At the time of the practical reality is that a particular research question can rarely be answered only within one philosophical domain (Saunders et al., 2012).

4.4 RESEARCH DESIGN

Punch (2000) indicates that the perceived role of research design is to form a link between the research questions and the data. Design resides amid the two (i.e. questions and data), showing how the research questions will be connected to the data, the tools and procedures to use for a response. The research design must follow from the questions and fit them to the data. The design is the basic plan for empirical research, and comprises main ideas such as strategy, sample, tools and procedures to be utilised in collecting and evaluating empirical data (Punch, 2000).

The design of the research was closely linked to the exploratory category. Robson (2002) explains that exploratory research is a valuable means of finding out "what is happening: to

seek new understandings; to ask questions and to consider phenomena in a new light". The exploratory design was therefore pivotal to developing the envisaged theory. Quantitative methods are often used in exploratory research and that was also the case with this research. Saunders et al. (2012) indicate that there are three principle ways of conducting exploratory research:

- the search of literature – the research used journals and books;
- interviewing subject matter experts – semi-structured face-to-face interviews were conducted with senior management from diverse economic sectors individually.
- focus group interviews – this research did not make use of focus group interviews.

There was an extensive search for pertinent literature using journals, books and other literary works. The results of the literature review and semi-structured face-to-face interviews enabled the preparation of a comprehensive questionnaire, ensuring that all the significant themes were covered. The questionnaire was the instrument used, and it was posted online for the respondents to participate in the research in the most objective manner.

4.5 RESEARCH STRATEGY

According to Denzin and Lincoln (2000), the qualitative researcher studies things in their natural setting, attempting to make sense of or understand phenomena in terms of the meanings people bring to them. This strategy consists of a set of interpretive, material practices that make the world perceptible. Using this strategy has enabled the researcher to dig deep into the factors for example (employee motivation, organisational culture and standardisation) in order to attain a complete understanding of IMS in organisations.

Saunders et al. (2012) state that the choice of the research approach must be guided by the research question and objectives, the scope of existing knowledge, the amount of time and resources available, as well as the philosophical underpinnings. This research was indeed guided by the research question and objectives.

4.6 DATA COLLECTION METHODS

Primary and secondary data collection methods are the two methods used in research. Secondary sources are all available sources of data in books, journals, reports, and other literary works. Primary sources refer to questionnaires and interviews. Silverman (2001) emphasises the meticulous understanding of data collection in both qualitative and quantitative approaches. The collection method chosen therefore informs the research instrument. This

research utilised a questionnaire as the primary data collection method with the use of books, journals and reports as the secondary methods.

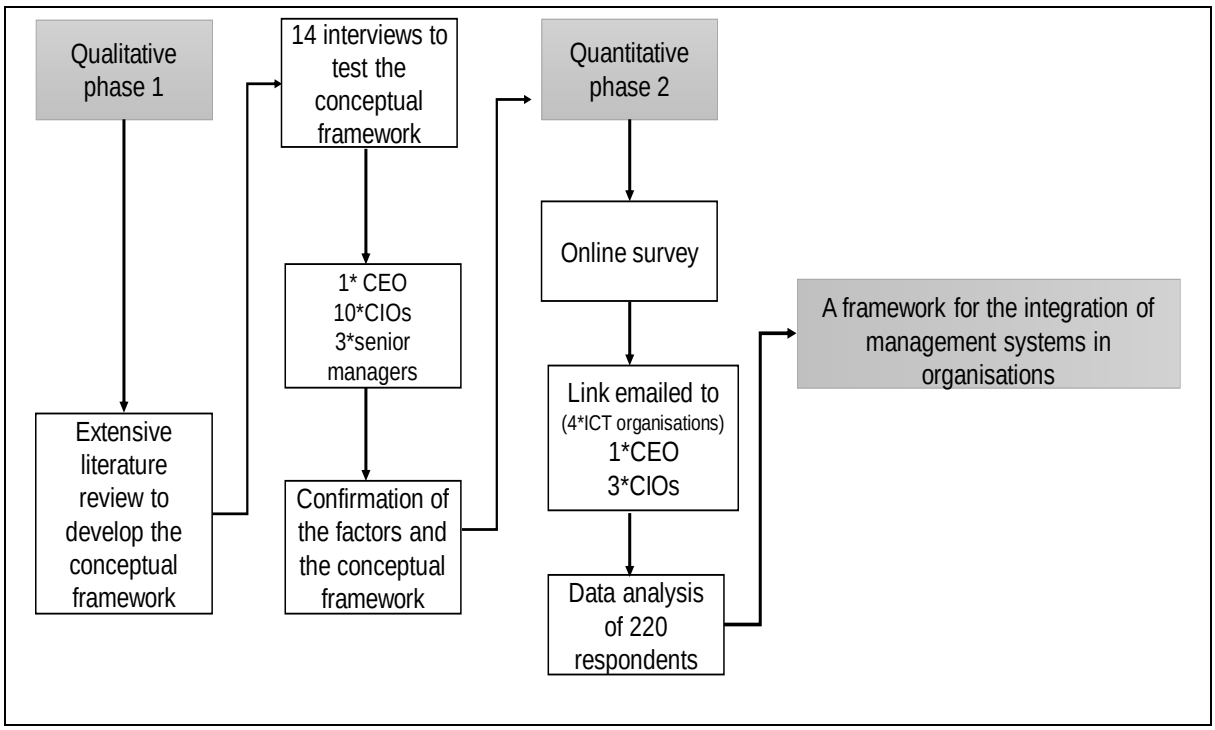

Figure 4.1: Research plan

Figure 4.1 reflects the research plan that the researcher adopted. Each step is described in detail below.

4.6.1 Review of the literature

The literature review considered several issues about IMS, such as theory-related integration (see Anderson, 1971), challenges (see Bernado et al., 2011), benefits (see Asif et al., 2009), standards (see Botzem and Dobusch, 2012) and combination (see Kurtz, 2012). This was undertaken to determine the IMS process, the significance and the factors contributing to organisational efficiency. This led to identifying gaps for the current research. A systematic review was carried out focusing on empirical research on several issues related to an IMS.

4.6.2 Identification of factors

The factors below, referring to main areas of enquiry, were identified from the extensive literature review:

- leadership (see Avery & Bergsteiner, 2011a);
- management (see Roberts & Handline,1975);

- integration policy (see Candel & Biesbroek, 2016);
- standards (see Muenstermann et al., 2010);
- employee performance (see Morton, 1991);
- standardisation effort (see Sherif, 2006);
- organisational culture (see Kotler & Armstrong, 2006);
- innovation (see Chen, 2016); and
- employee motivation (see Maslow, 1970).

These factors informed the conceptual framework for the integration of management systems in organisations. The preliminary questionnaire was designed based on the different themes that emanated from the literature review (see chapters 2 and 3). The questionnaire was then enhanced using the results of the semi-structured face-to-face interviews.

4.6.3 Interviews

The purpose of the exploratory phase was twofold.

- to gain some deeper understandings about the IMS in organisations against the backdrop of IMS literature. The insights generated from the qualitative phase informed the quantitative phase to develop the research instrument, i.e. questionnaire for the second phase; and
- to negotiate access for the quantitative phase of the research.

4.6.4 Research instrument

The instrument used to gather the data was a self-administered, closed-ended, structured questionnaire that was posted online for the participants. At the end of the questionnaire, an open-ended questionnaire was posted as well, which comprised questions that pertained to an IMS generally. The questionnaire used a Likert-type scale to measure the responses of participants.

Neuman (2000) provides the following advantages of using a self-administered mail questionnaire:

- they are relatively cost-effective compared to face-to-face or telephonic interviews;
- a questionnaire can be sent to a varied geographical area;
- the respondent is able to complete the questionnaire at his or her convenience and he or she may consult personal records, if necessary;
- it offers anonymity and avoids interview bias; and.
- it is a very effective and efficient means of research.

Neuman (2000) also describes some perceived disadvantages:

- low response rates could jeopardise the validity of the research;
- some respondents might respond only after a protracted period of time;
- someone other than the intended participant could open and complete the questionnaire without the knowledge of the researcher; and
- incomplete questionnaires.

The above disadvantages were closely monitored by the researcher. Fortunately, the response rate of this research was acceptable.

4.6.4.1 Questionnaire

The objective of using a questionnaire was to gather the required information from the participants. The preliminary questionnaire was developed using the information from the literature review. The interviews with senior management allowed for the questionnaire to be enriched by providing important information and all confusing questions were excluded. The questionnaire was quality assured when they went through the ethical clearance process of Unisa. The data was captured on an online database linked to the tool used.

4.6.4.2 Likert-type scale

The Likert-type scale was used with statements providing a number of options to answer the closed-ended questions. The options ranged from strongly disagree to strongly agree on a seven-point response scale in terms of the attitude being measured.

- 1 = Strongly disagree
- 2 = Disagree
- 3 = Somewhat disagree
- 4 = Undecided
- 5 = Somewhat agree
- 6 = Agree
- 7 = Strongly agree

The use of a seven-point scale provides the following advantages:

- it helps respondents to make good judgements and offers them a degree of flexibility of choice to reflect the intensity of their views;

- it allows the researcher to use a variety of statistical techniques and to conduct a powerful statistical analysis; and
- it allows the researcher to code and analyse the data with simplicity (Hussey & Hussey, 1997).

4.6.4.3 Pros and cons of a Likert-type scale

Bertram (2015) provides some strengths and weaknesses of the Likert-type scale, as discussed below.

Strengths:

- extensively used in survey research;
- a wide variety of constructs can be utilised;
- easy to construct;
- likely to produce a highly reliable measure;
- easy for participants to complete;
- easy to analyse; and
- the use of factor analysis for the data works very well.

Weaknesses:

- central tendency bias – participants may avoid risky response categories;
- acquiescence bias – participants may agree with statements as presented in order to satisfy the researcher;
- social desirability bias – participants may portray themselves in a socially favourable light rather than being truthful; and
- validity may be difficult to demonstrate – does the instrument evaluating what the researcher sets out to measure?

4.6.4.4 Design of the questionnaire

The following criteria were used to design the questionnaire. This is in line with Eiselen, Uys and Potgieter (2005):

- questions should be short, simple and to the point;
- questions should have clear guidelines;
- questions should not have double negatives;
- respondents should be requested to express opinions about their own views;

- questions should be neutrally phrased;
- questions should not contain any emotional language;
- questions should not make the respondent feel remorseful;
- questions should not have esteem bias; and
- questions should provide all possible answers.

4.6.4.5 Content of the research instrument

The questionnaire was structured so that they were precise, informative and attractive. The front page explained the rationale for the research and tried to provide a sense of comfort to the respondent by indicating the ethics clearance number from the SBL for the research as consent to undertake the research.

The questionnaire comprised the following:

- Section A: biographical information of the respondent; and
- Section B: constructs with related sub-questions.

The questionnaire contained statements and questions that adequately addressed the primary and secondary research objectives, as well as the research question. Consideration was afforded to the fact that respondents might grow weary of a questionnaire with too many questions. Only pertinent questions were included that were perceived to contribute valuably to the design of the framework for integration of management systems. The questionnaire i.e. interview guide (see Appendix C) and research questionnaire (see Appendix D) are presented at the end of this document.

4.6.5 Population

The population comprised South African ICT organisations. The ICT sector was chosen, as this is a sector that is involved with development, management and continuous improvement of management systems. This was done following advice from senior professionals and experts, i.e. professors in the field of research. However, all South African ICT organisations could have participated so the research introduced the following selection criteria:

- the organisation had to be based in South Africa and be a listed organisation either in South Africa or internationally;
- the total gross revenue had to exceed one billion rand annually;
- the organisation had to have a global footprint, meaning organisations had to have a presence in at least more than three continents.

These strict criteria were introduced to ensure that only Multi National Companies (MNCs) with extensive knowledge of IMS could be drawn as a sample.

4.6.6 Sampling

There are various methods of non-probability sampling. Neuman (2000) discusses the options:

- **haphazard sampling** – selection of cases that are deemed convenient;
- **quota sampling** – selection of a set number of cases in each of several predetermined categories that will represent the diversity of the population using haphazard methods;
- **purposive or judgemental sampling** – selection of all possible cases that meet particular criteria, and which are normally linked to the research question;
- **snowball sampling** – selection of cases using referrals from a few cases and then referrals from those cases and so on;
- **deviant case sampling** – selection of cases that are different from the prevailing pattern;
- **sequential sampling** – selection of cases until there is no additional information, normally reaching saturation; and
- **theoretical sampling** – selection of cases that will help expose features that are theoretically significant in terms of a particular topic.

From the criteria stipulated for the population, only four South African ICT organisations represented the population.

Therefore, there was no sampling undertaken for this research. The link to the survey was emailed to the leader of the organisation once permission had been granted. Thereafter, the leader forwarded the link to the survey to the organisation. In this way, the researcher succeeded in achieving an acceptable response from participating organisations. From the population, the participant target was set at 500.

4.6.7 Sample size target

No sampling was undertaken for the ICT organisations that could have restricted participation. It was interesting to analyse the data of the ICT organisations, which provided views from different levels of solidity (see Strydom & De Vos, 1998). Table 4.2 presents a summary of the sample to the four organisations that participated in the research.

Table 4.2: Summary of the population and sample size

Population	Targeted sample	Actual respondents
Organisation A	100	220
Organisation B	125	
Organisation C	125	
Organisation D	150	
	Total = 500	**Total = 220**

4.6.8 Response rate

The response rate was n = 220 (44%) of the targeted 500 target population.

4.7 SIZE AND RESPONSES

The guide by Strydom and De Vos for sample size (see Table 4.3) was relevant to this research. Of the targeted 500 participants, 220 responses were received.

Table 4.3: Sample size guide

Population	Percentage suggested	Number of respondents
20	100%	20
30	80%	24
50	64%	32
100	45%	45
200	32%	64
500	20%	100
1 000	14%	140
10 000	5%	450
100 000	2%	2 000
200 000	1%	2 000

Source: Strydom and De Vos (1998)

This is a response rate of 44.00%. According to Strydom and De Vos (1998), for a population of 500, a response of 20.00% is deemed acceptable. It is therefore affirmed that the response rate was acceptable and the findings could be generalised over the community without reservation.

4.7.1 Data collection method

The questionnaire was posted online using LimeSurvey. The link to the questionnaire was sent to the leadership of the organisations. A covering letter included in the survey was distributed

to all participants explaining the rationale for the research, their rights to anonymity, and their rights to decline participation at any stage of the research process. The researcher had full access to the databases of the raw data. The researcher retrieved the raw data on a daily basis and saved it on an external hard drive. The survey was allowed to run for three weeks from the date of inception after which the link to the survey was deactivated.

4.7.2 Data analysis

The raw data was sent to the statistician for analysis and interpretation. The statistician used the Statistical Package for the Social Sciences (SPSS) software to do the statistical analysis. Through factor analysis, the significant factors were identified. It is important to note that the Cronbach's alpha index of each sub-construct confirmed that a particular factor was indeed a factor or not. The constructs were used to design the framework for the integration of management systems.

4.7.2.1 Quantitative analysis of data

Welman and Kruger (2005) describe descriptive statistics as concerned with description and summary of data in the form of frequency tables, graphs and measures of central tendency. They regard inferential statistics to be concerned with inferences that one can make about the general population under research centred on the sample drawn randomly from the population. Wiśniewska and Stead (2007) refer to inferential statistics as concerned with reaching decisions about the population based on the descriptive statistics of the sample.

The quantitative analysis for this research made use of the conventional descriptive statistical methods, frequency distribution, means and standard deviations.

The following statistical techniques were used in this research:

- factor analysis to extract the most relevant and significant factors;
- evaluation of internal reliability of the research instrument by using Cronbach's alpha;
- evaluation of the normal distribution of data by using skewness and kurtosis tests;
- the measurement of sample adequacy using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy;
- Bartlett's test of sphericity (see Hair, Anderson, Tatham & Black, 1995) was used to associate the observed matrix to the identity matrix. In other words, this test checks whether there is a certain redundancy amongst the variables that will allow a summary of a few number of factors (see Field, 2005); and

- Pearson's chi-square test of association (see Hair et al., 1995) was utilised to test the strength of association between factors that are related to each other.

4.7.2.2 Factor analysis

The purpose of factor analysis is to condense a large set of data into a smaller subset of measurable variables (Field, 2005). Representative variables emanate from each group of variables. The following are the considerations for the measurement to be accurate (Field, 2000):

- The variables should roughly be normally distributed; this makes it conceivable to generalise the results of the analysis beyond the sample collected.
- The sample size should be taken into consideration, as correlations are not resistant and can hence influence the reliability of the factor analysis.
- The most significant factors in determining reliable factor solutions are the absolute sample size and the absolute magnitude of factor loadings. The more frequent and higher the loadings are on a factor, the smaller the sample can be.
- As communalities become lower, the significance of the sample size increases.

Hair et al. (1995) suggest that a sample size (preferably 100 or larger) is required. This research targeted a sample of 500 respondents, which made factor analysis effective. The decision tree in Figure 4.2 above provides a simplistic view to the steps to be taken in undertaking factor analysis for this research.

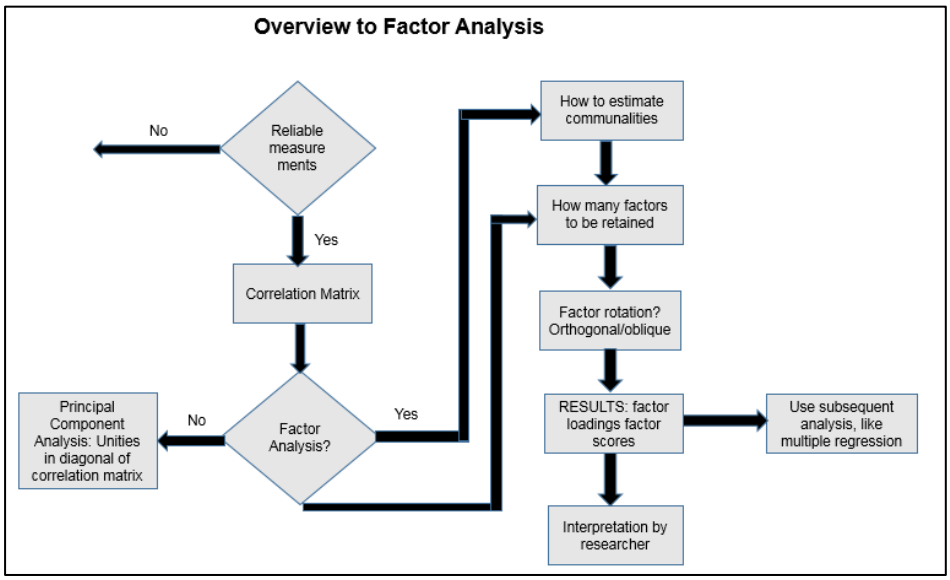

Figure 4.2: Overview of the steps in factor analysis

Source: (1993)

The KMO measure of sampling adequacy was used to check whether the sample was large enough. The sample is adequate when the value of KMO is greater than 0.5 (Rietveld & Van Hout, 1993). All elements on the diagonal of this matrix should be larger than 0.5 for the sample to be considered to be tolerable (Field, 2000).

4.7.2.3 Cronbach's alpha

The use of Cronbach's alpha index aims to prove the reliability of the questionnaire (Field, 2005). Individual items (or sets of items) should produce results consistent with the overall questionnaire (Field, 2005). Validity and reliability are two fundamental elements in the evaluation of a measurement instrument (Tavakol, 2011). The Cronbach alpha index is expressed as a number between 0 and 1, with the higher values denoting higher reliability among the indicators. As stated by Tavakol (2011), the Cronbach alpha index describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test. Internal consistency should be determined before a test can be employed for research or examination purposes to ensure validity (Tavakol, 2011).

4.7.2.4 Structural equation modelling

According to Hair et al. (1995), one of the primary objectives of multivariate techniques is to expand the researcher's explanatory ability and statistical efficiency. Multiple regression, factor analysis, multivariate analysis of variance and discriminate analysis provide the researcher with powerful tools for addressing a wide range of managerial and theoretical questions (Hair et al., 1995). However, they all share a common limitation: each technique can only examine a single relationship at a time (Hair et al., 1995). Structural equation modelling (SEM), which is an extension of several multivariate techniques is most notably factor analysis and a type of multiple regression analysis. SEM can examine a series of dependence relationships simultaneously (Hair et al., 1995). One of secondary questions of this research was to examine the relationships between the factors and SEM to be used to address this question (see section 1.4).

4.8 ASSESSMENT OF RELIABILITY AND VALIDITY

This section discusses reliability and validity.

4.8.1 Validity

According to Bryman (2012), 'validity' refers to the matter of whether an indicator underakes to gauge a concept really measures that concept. Several ways of assessing validity are explored: face validity, concurrent validity, predictive validity, construct or measurement validity and convergent validity.

4.8.2 Face validity

Bryman (2012) refers to the notion that face validity implies that the measure ostensibly reflects the content of the concept in question. In the current research, this was done by engaging with people who were either senior management or leaders of the organisation. The researcher also engaged with fellow researchers and his supervisor extensively. These engagements allowed the researcher to review the questionnaire relentlessly until they were deemed valid.

4.8.3 Measurement validity

Measurement validity establishes whether a measure that is devised of a concept really does reflect the concept that it is supposed to be denoting (Bryman, 2012). In this research, the researcher ensured that a pilot survey was conducted with his fellow academics; thereafter, the survey was discussed with industry specialists to ensure the instrument was measuring what it intended to measure.

4.8.4 Internal validity

'Internal validity' is about causal relationships (Hair et al., 1995). In the current research, the data was collected according to a justifiable research plan for which valid data interpretation and inferences about the findings were made. In other words, the research was conducted in such a way that effects of extraneous factors on events were ruled out in the interpretation of the data.

The common forms of internal validity are:

- **content validity**, the extent to which the instrument provides adequate coverage of the investigative questions;

- **criterion-related validity**, which is measured as the correlation between a criterion and a predictor, that is the degree to which the predictor is adequate in capturing the relevant aspects of the criterion; and
- **construct validity**, which concerns abstract characteristics for which no empirical validation is possible (Serumaga-Zake, 2016). This form of validity can be addressed through a careful definition of the topic of concern, the items to be scaled and the scale to be used, and/or by using experts or a panel of judges.

After constructing the questionnaire, it was tested for refinement. The questionnaire was subjected to criticism by experts familiar with the nature and scope of the research and principles of question construction. This afforded the researcher an opportunity to determine the time taken for administering the questionnaire, obtaining feedback from the individuals from the target population who were used in the pilot study (but who were not used in the formal survey), discover problems, test the credibility of the interviewer by letting him or her present and explain the questionnaire to respondents, check whether the principles of construction have been respected, and evaluate how the questionnaire was understood.

For qualitative data, triangulation was used to address the issues of internal validity of the research. Both extensive literature review and in-depth interviewing were used to collect data.

4.8.5 External validity

External validity deals with the question of whether the results of the research can be generalised beyond the specific research context (Bryman, 2012). For this to happen, the sample must be a good representation of the target population and of a large sample (Bryman, 2012). This research used a representative sample of a large sample. With an acceptable response rate (44%) and a representative sample (220), the external validity of this research was satisfactory.

4.8.6 Internal reliability

Reliability refers to the consistency of a measurement, which is normally measured by Cronbach's alpha coefficient (Hair et al., 1995). In quantitative research, reliability measures the extent to which the sample used gives an accurate representation of the target population (Bryman, 2012). In this research, internal reliability was measured by using Cronbach's alpha index.

To enhance the credibility of the qualitative data, the researcher used triangulation, in which case methods for obtaining data are used, that is interviews and intensive literature review.

4.8.7 Assessing normal distribution

For valid results, one of the assumptions of factor analysis that should not be violated is normality of the distribution of a variable (Bryman, 2012). Therefore, it was important to check the data for normality before the researcher undertook the factor analysis. The central limit theorem (see Hair et al., 1995) was applied, which states that for large sample sizes (n > 30) drawn randomly from a population, the distribution of the means of those samples will approximate normality, even when the data in the parent population are not distributed normally. The values for symmetry of skewness of close to zero and kurtosis of between negative two (-2) and positive two (+2), (George & Mallery, 2016) are considered acceptable for a normal univariate distribution which was in line with this research.

In this research, normality was assessed by examining the skewness and kurtosis of the distribution of the variables. Furthermore, the maximum likelihood method (see Fuller & Hemmerle, 1966), which is relatively insensitive to the deviation from normality, was adopted.

4.9 CHAPTER SUMMARY

This chapter identified the research scope as the four major ICT organisations that have a presence in South Africa which were used to answer the research problem. The research problem was that there is inadequate understanding of the process and requirements for the integration of management systems towards improving efficiency in an organisation.

From the research problem, the research objectives were formulated. In order to meet these objectives, the research philosophy for this research followed the principle of positivism (see section 4.3.2). This research utilised the qualitative (semi-structured face-to-face interviews), which gave deeper insights into IMS and also confirmed the IMS conceptual framework. The next phase was a web-based questionnaire that was designed and hosted by a professional web page designer. A pilot research was undertaken with academic peers and industry experts in the field of IMS. The pilot questionnaire was updated with minor changes. There was a total of 220 respondents.

The research methodology used was discussed (see 4.2.1). The methodology provided the assurance that the research was undertaken in a methodological sequence. The questionnaire was informed by the literature review and interviews results. The next chapter discusses the analysis of the data collected from the use of the questionnaire.

CHAPTER 5

DATA ANALYSIS, FINDINGS AND DISCUSSION OF RESEARCH RESULTS

5.1 INTRODUCTION

This chapter presents the results that were obtained from the qualitative and quantitative phases of the research. The chapter begins by with a discussion of the semi-structured face-to-face interviews that confirmed the factors and the conceptual framework. Thereafter, the quantitative phase will be analysed and discussed in the light of the electronic survey of the 220 participants from the four ICT organisations. Reliability and validity of the constructs were determined and are reflected in this chapter followed by the results of the hypothesis testing, which in turn is followed by a discussion of the SEM. The raw data was furnished to the statistician so that the statistical analysis could be undertaken. Finally, a conclusion is presented at the end of this chapter (see 5.13) to highlight the findings from the research. Figure 23 below illustrates the outline of this chapter.

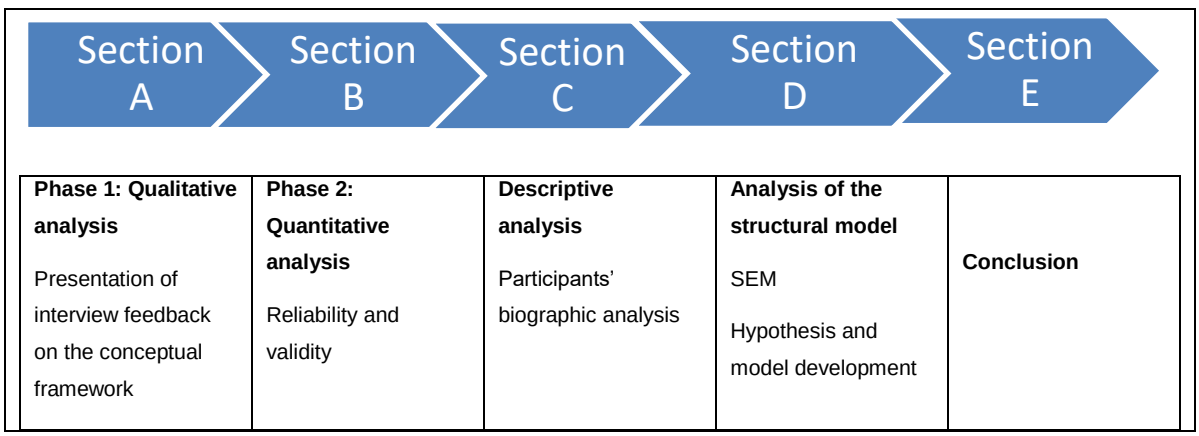

Figure 5.1: Chapter 5 outline

Section 5.2.1 focuses on the interview feedback and the factors for the conceptual framework. Section 5.7 focuses on the demographic details of the participants. The demographic details are outlined to put the results of the research into context.

Section 5.8 presents the analysis of the data from the survey and discusses the responses from the semi-structured interviews in the context of the literature. The Kolmogorov-Smirnov (KS test) was used to compare variables across independent groups.

Section 5.11 addresses the SEM. Path analysis, a variation of multiple regression analysis (Perlman, 2013) was used in this chapter to provide estimates of the magnitude and significance of hypothesised causal connections. In other words, this statistical method examines the comparative strength of both direct and indirect variables (Perlman, 2013). Section 5.13 provides the conclusion for this chapter.

5.2 SECTION A: QUALITATIVE ANALYSIS

The purpose of the section is to provide a review of the semi-structured face-to-face interviews.

5.2.1 Interview feedback

This section presents an overview of the feedback from the fourteen semi-structured face-to-face interviews that were undertaken in organisations.

The research participants considered were 1 CEO, 10 chief information officers (CIOs) and 3 senior managers from diverse economic sectors of the South African economy. Participants were chosen from different sectors of the South African economy which included fast moving consumer goods (FMCG), government, information and communication technology (ICT) and banking industries. These participants were selected on the basis that they played a pivotal role in driving the IMS in their organisations. Moreover, by virtue of their roles within the organisation, the CEO, CIOs and senior managers were expected to know more about the IMS than any other manager or executive. A total of 14 semi-structured face-to-face interviews were undertaken within organisations to test the conceptual framework for the IMS. These interviews proved to be exhaustive and confirmed the validity of the questions and the conceptual framework. The participants were chosen strategically to try and obtain a constructive view. At the point of 10 semi-structured interviews, data saturation was reached.

5.2.2 Profile of participants

For the interviews, the participants comprised the following:

- CEOs, CIOs or senior managers in their respective fields;
- over 10 years of experiences within the field of integration; and
- experience included dealing with local and international organisations regarding the IMS.

The research required the three parameters listed above, as this was expected to ensure globalisation issues were considered for the IMS as well. All meetings were undertaken at the offices of the organisations and there were no disturbances during the course of the meetings.

5.2.3 Rationale for using ICT organisations as the sample

Considering that ICT organisations develop, implement and manage IMSs for other organisations, the research utilised the four major ICT companies based in South Africa with a global presence as input to the research (see also section). After each interview, each CEO and each CIO were requested to endorse the research and request their employees to take part in the quantitative part of the research.

5.2.4 Checklist for the semi-structured interviews

The semi-structured face-to-face interviews lasted between 35 and 60 minutes each. The interview guide is attached in Annexure C. The checklist below was used as guide. The interviewer used broad questions to ease into the interview to ensure the participant was feeling relaxed.

- Appearance at the interview by the interviewer.
  - Formal, with coat.
- Information of the interview
  - Meeting request was sent via email to participant. Acceptance was received.
  - To ensure punctuality, the interviewer arrived 30 minutes prior to meeting with participant.
- Opening of the interview (all covered in less than 5 minutes)
  - The participant was thanked for the time taken to contribute to the research.
  - The purpose of the research and the progress were outlined.
  - The right to confidentiality was addressed.
  - The participant's right not to answer any question was highlighted as well as the right not to continue at any point.
  - An offer to provide a summary of the research findings was extended.
  - The request to record the interview was stated and was granted. A Samsung Galaxy S6 edge and a Dell computer were used simultaneously as backup.
- Asking questions and behaviour during the interviews
  - First question was broad and settled the participant.
  - Closely followed was the interview guide to ensure the themes were covered.
  - Use of follow-up expressions such as 'Oh' and 'Ah'.

    - Use of short follow-up questions, such as ‘that is interesting’.
    - Demonstration of attentive listening skills.
    - Testing understanding by summarising.
- Closing the interview
    - The participant was thanked for his or her time for contributing to the research.
    - Only the four ICT participants were requested to endorse the quantitative part of the research, which would be sent to organisation via email.

The interviews proved to be extremely beneficial to the research, but more specifically to instilling confidence in the research instrument. The interviews yielded the following common aspects:

- **Leadership** – all participants claimed to use a combination of leadership styles. which were not limited to participative, delegative, supportive and directive leadership. It was deduced that organisations wanted to empower their management so that they could be more effective in their leadership styles. This would lead to improving the efficiency in implementing an IMS in their organisations.
- **Management** – management indicated that leadership was not consistent in decision-making, lacking trust, and policy implementation was either not enforced or non-existent.
- **Policy** – policy on integration of management systems was not seen as important by 6 of the 13 organisations. From the interview, it was evident that one organisation had a procedure to manage the IMS. Although it was not forthcoming from the interviews that policy on the IMS was not necessary for corporate organisations, it is evident that having a policy on IMS was extremely important and therefore it was perceived that policy should form an important factor for the IMS of organisations.
- **Standards** – all organisations had at least a national standard. However, standards were perceived to be an important factor to satisfy stakeholders’ needs especially in the FMCG sector. Government did not implement standards and deemed it as a non-critical requirement.
- **Employee performance** – employee performance was seen as important for organisational efficiency. However, the silo effect was evident in most organisations and integration of management systems will be a problem when this process is undertaken.
- **Standardisation effort** – skills development and training seemed to be important factors for the IMS. Some organisations took the lead in standard implementation and

expended considerable effort to ensure that transfer of knowledge, skill and experience was part of the fabric of the organisation.

- **Organisational culture** – organisations seem to differ in terms of especially a high-performance culture. It seems that the goals of the organisation and employees' goals should be aligned to be a cohesive unit, although this was not evident from most of the interviews. Theoretically, organisational culture should be driven by top management; however, this was not consistent across the management of organisations who were interviewed.
- **Innovation** – innovation seemed to be conflicting. Leadership indicated that employees should be innovative in their work situations and improve the efficiency of the organisation. However, innovation platforms were still a problem and needed to be developed at all three levels of the organisation (strategic, business and operational).

The interviews reached saturation point at the tenth interview. The researcher chose to continue to confirm that representative sectors of the economy were covered. This totalled 13 organisations with 14 interviews. The information gathered confirmed the conceptual framework and ensured the validity of the preliminary questionnaire. The reaserch questionnaire was enhanced with minor changes.

Each construct is represented with sample responses from the transcripts (see Annexure E). Not all transcripts could be included in the discussions; only examples of extracts are therefore presented.

5.2.4.1 Leadership

Leadership was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding leadership. All quotations are reproduced verbatim and unedited.

Interview [1]

> [S]o it's actually more useful sometimes when whatever you want to put forward as leadership into your organisation, the people buy into. So when you start to actually talk to people, using our design thinking philosophy, and not having to know all the answers but sitting, engaging, understanding and when leadership shows that they are committed to making the change, that they're committed to listening to the people, that's half the battle won already. So I think one part is having these listening clinics or having these conversations to understand what's going on and then start to communicate the strategy

> for the organisation, these are some of the key things you've got to do over a certain horizon, short term to medium term to long term and once you've done that you've kind of to set in the minds of people in your organisation where you as a leadership want to go and what commitment.

Interview [2]

> [Y]ou've got your leadership profiles and your sponsorship profiles and your stakeholder management and all of those elements of a framework very nicely planned out because without those, you're obviously going to struggle to do it (IMS).

Interviews [11]

> So, for leadership it's integrated, it's not silos. Ja, sometimes for management it's, you feel the silos and management informs that leadership.

Interview [13]

> So, obviously, even if you look at the organisation, I set my priorities for the year, and I cascade down to my lower level managers, my leadership team. They cascade it down to, if they have managers, to their managers and ultimately the team, which is, you know, the sales team, services team or whatever that team is. So, we also, you know, in terms of KPIs [key performance indicators] and measuring performance, that's. I mean, I, my leadership team can change, but I have my priorities that I give to them. They may have individual priorities per industry they then cascade down. So, from a systems perspective you know, my primary management systems, if I look at management tools to manage this business, it is the HR system called success factors, CRM [customer relationship management] for longevity and the current health of my business.

Interview [14]

> Well, it can be kind of perceived as one, they are the enablers, because they are the ultimate decision-makers in terms of actually enabling what systems we use. But also, it can be seen as, they are the users. So, also interface with the system, but at a different level. So, the system for them provides the information …

From the discussions, it was evident that leadership was an important factor for the IMS and that it had to be included in the conceptual framework.

5.2.4.2 Management

Management was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews.

Below are extracts from the participants regarding management. All quotations are reproduced verbatim and unedited.

Interview [2]

> [S]o senior management would basically interact with the likes of your architects and stuff like that and try to understand you know how we're going to fit everything together. Remember, our senior management's sole purpose is for SAP, so they need a continuous upstream and downstream of information regardless of what system it is, so we have our own goal you know so we just want to make it happen in other words. So they would interact with the architects to basically understand.

Interview [10]

> The system [IMS] that will enable management and executives to have certain analytics, productive analytics about your organisation so that will include the engine of your reporting, your scorecard capability and your analytics for you to forecast for the future business as well as understanding that past engagement …

Interview [12]

> It's not that easy to answer because it's sometimes it's personal, so it's case-by-case. So, in some management team, we find people more into systems as a way to empower the organisation. Then the role is very positive. And for some others, especially for older generations, I don't know if it's the right word or not, is, often times they don't consider ISIT as, can empower the organisation. So, it's case by case.

Interview [13]

> From a people management perspective, so in terms of development of individuals, in terms of leave management, in terms of, you know, performance calibrations etc., we have a system, an HR system called success factors, and I manage my people with that. So, obviously, even if you look at the organisation, I set my priorities for the year, and I cascade down to my lower level managers, my leadership team. They cascade it down to, if they have managers, to their managers and ultimately the team, which is, you know, the sales team, services team or whatever that team is. So, we also, you know, in terms of KPIs and measuring performance, that's. I mean, I, my leadership team can change, but I have my priorities that I give to them. They may have individual priorities per industry they then cascade down. So, from a systems perspective you know, my primary management systems, if I look at management tools to manage this business, it is the HR system called success factors, CRM for longevity and the current health of my business.

From the discussions, it was evident that management was an important factor for the IMS and that it had to be included in the conceptual framework.

5.2.4.3 Organisational culture

Organisational culture was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding organisational culture with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [1]

> Now, from a management systems perspective, what's important to know in our organisation, we have a culture we call high performance delivery, and part of that culture is actually identifying very, very clearly and very simply what those clear goals are for the global organisation, those then it can cascade into all of our vertical of businesses as well as our horizontal businesses that seek to actually enable these vertical go to markets and by having it singularly focused, not only do you understand how we need to manage our global organisation for local benefit, but making sure that when do go to market, differentiated value proposition. It's that cascading of a singular strategy into a local content, it's very powerful to differentiat ourselves as an organisation in a very crowded marketplace, especially given a very competitive landscape right now.

Interview [10]

> Culture is always, it's I mean think about if I'm talking integration, I'm talking standardisation, the policy on that coming from the global, to ensure that it's embraced, it's not a painful execution. The ownership at the senior management to take the management thereof to ensure … to hold their hands and ensure that it's executed and that requires management to be fully involved in that process because it can just be an email moratorium that is coming from the top but if it's not embraced by management to say we have got to do this, these are the benefits of us doing A, B and C and we need to change and this change will lead to this specific outcome goal, it will be adopted.

Interviews [11]

> It's a default answer, efficiency. So, if you have integration, then you'll have efficiency, for sure. This is one. Second is integration also, it's the social power of the integration so, it means that integration. I believe, that you need to build up a kind of one culture for your organisation. You need to make sure that.

From the discussions, it was evident that organisational culture was an important factor for the IMS and that it had to be included in the conceptual framework.

5.2.4.4 Employee motivation

Employee motivation was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding employee motivation with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [4]

> The system that will enable management and executives to have certain analytics, productive analytics about your organisation so that will include the engine of your reporting, your scorecard capability and your analytics for you to forecast for the future business as well as understanding that past engagement.

Interview [7]

> So because of the technology that we have available to us we don't do performance reviews, we have continuous feedback with our employees, and everything is recorded on our HR performance.

From the discussions, it was evident that employee motivation was an important factor for the IMS and that it had to be included in the conceptual framework.

5.2.4.5 Employee performance

Employee performance was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding employee performance with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [4]

> [I]t's actually scrapped its traditional performance management system. So your traditional performance management system is linked to or the strong correlation to remuneration. We've actually completely scrapped that and replaced it with what we call a performance management system. So what we're trying to do is put a strength-based culture in the organisation where we focus on creating the strengths in people as opposed to negatively criticising them for their weaknesses. And we recognise every person has their own journey within an organisation, and we see to it to identify on an individual basis a microcosm of a

> performance management culture that's very individual-based. Every person feels loved and welcome and identify where there are errors for development and what their strengths are and we don't necessarily correlate how they get remunerated with their performance and their clear development within the organisation. So two things again, one from the top down perspective, we've got the strong consistent leadership vision for the organisation that cascades clearly into all of the organisations that make up …

Interview [8]

> So for me, and to answer your question and to relate it to this organisation, would be this integrated nature of it is that the parts of the business and the silos which we maybe have been operating in previously now come together in terms of contributing and making meaningful, adding value in terms of individual divisions – individual departments rolling up to cluster level and then to department they want. So all of this comes together, talking to each other and it's also top down and a bottom up approach, but at the top down we have very clear strategic focus areas and these need to be cascaded down. In fact right down to the individual performance contracts, so that these parts, even each person in the organisation in the system of management information system that's integrated, is that it's all got to come together to roll up into the ultimate goal, mission and vision of the bank and the five very strategic focus areas.

From the discussions, it was evident that employee performance was an important factor for the IMS and that it had been included in the conceptual framework.

5.2.4.6 Policy

Policy was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding policy with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [1]

> We have not just policies, our policies are very strong policies, whether its ethics, or compliance, or whether it's a finance management or time reporting we have all the key policies in place that enable to appoint a standardised way of working.

Interview [4]

> We definitely do have that policy of integration.

Interview [10]

> So policies will also filter to your business processes right, so remember depending on what's required from a business perspective that's how your policies also get aligned.

Interview [1]

> Well, we **don't have a policy** per se to say, you know, what needs to be ticked off from an integration point of view. We don't have that in place. We follow the same governance that I've just given to you now. It needs to be secure. So I think, so it depends. There's a lot of different frameworks that you need to keep in mind. So we don't do anything on the fly, we follow frameworks. So you must be aware of the ISO 27001 framework.

Interview [11]

> I don't know, I have a different point of view. It's not written yes, but its, there is a process in place. So, in a global term, in the global team we have what's called a standardised procedure and they have operations, sorry, the main directors, who's the decision-maker on the platform, the technology and ISIT solutions. Now it's, and then actually, we should not pick up something up of standard portfolios and if we need to pick up something out of a standard portfolio, we need to get the sign-off, the operators and the main directors, to make sure it's integrated, and accepted.

Interview [11]

> Not that I know if, but I had a policy at De Beers on integration.

Interview [14]

> Management systems really for us is kind of what we use as part of governance. So, governance wise, those, the governance systems are mainly there as I described, the quality environment, safety, operations governance, is built into that and then you'll get, you'll have an internal audit team that actually has a company policy methodology of auditing operations, and that gives management really kind of a health-check in terms of how well you're doing, or not. And then to support that, you would have an external audit committee, and we use PWC to do an external audit, to tell if the internal audit system is checking the right controls.

From the discussions, it was evident that policy was an important factor for the IMS and that it had to be included in the conceptual framework.

5.3.4.7 Standards

Standards was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding standards with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [1]

> So even our people have been forced to work regarding to policies and standards that have been set up by a client organisation we always supersede and prioritise our own value proposition to make sure it doesn't dilute a third-party cultural standard overpower our EVP [economic value add] for our people.

Interview [3]

> We also standardise a lot of these systems to ensure integration is happening. So, I think that is the core of getting to an integrated way, it's a repeatable way of doing things across the system, which is measured as well.

Interview [6]

> So our aim, because we're a global company, is not to do anything local/global. Okay, so, and that's what we're focusing on. That's quite an extensive process and we use certain standards there, so it's not …

Interview [12]

> Okay, so it's actually from ISIT point of view, it's much better to have the same platform, standard process across, which will make sure, will make you easier to support the process and system with less work, let's say it this way. But also, it's, we should take in consideration as well, the business uniqueness. Yes, for sure for some areas, it's much easier to have a standard, let's say HR, but for some other areas, let's say for sales, it's much better to take its uniqueness of the business type, the market, the local market, into consideration.

Interview [13]

> No. So, if you mean combined, by, let's think about this a little right. So, I suppose combined could be a combination of let's say, let's look at SAP as an example right. So, we have, I have payroll right. Standardised is the standard payroll that comes from where the software is developed, which is Germany right. So, it has some international standards, some best practice etc., etc., etc. Then there's South African legislation that says that this is how we

> have to, these are the rules for paying tax etc., etc. And that little bit of customisation then gives me a bit of a combined system, that's sort of standard and localisation, if you want to call it that.

Interview [14]

> A standardised system, I suppose comes from the definition of the word standard. So, it is a system that is defined by predefined standards that can be kind of either local or international. So, local it's defined internally and a standardised system could be local to an organisation. Like, for example, if you look at our organisation in the breweries, you'd have many technical standards and systems which has got some alignment, you could say, and will be aligned to some recognised standard externally, but sometimes very specific to the operations internally. And then the external system is generally based on a recognised standard that has been agreed by a code of practice, by a community, whether it is the International Standards Organisation [ISO] or whether it is a local standards organisation. And that's where the ISO systems etcetera actually.

From the discussions, it was evident that standards were an important factor for the IMS and that it had to be included in the conceptual framework.

5.2.4.8 Innovation

Innovation was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding innovation with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [7]

> There's many different siloed-thinking people who work separately and there's a lot of this, not built here mentality - I'm very different. Well you're not different, a balance sheet is a balance sheet is a balance sheet, and if you try and be different there's something wrong, yes when you try to be innovative like SAP. We develop software, that's where we will be different, but in terms of HR and finance and procurement we don't need to be different, we need to be efficient, and that's the challenge, focus on what's core to your innovation, and the rest of it, guys we need to be standardised, we need to be simple and we need to have a common set.

Interview [13]

> Remember, … is beyond ERP [enterprise resource planning], I mean innovation …

> You know, a system can be anything right, it's, so, for me it is, it should be things working together to give me the information that I require. It doesn't necessarily, it could even be physical work-force right. It doesn't necessarily have to be an IT system. I mean I could have people running these on pieces of paper that I ultimately put a report together that links into, you know, my HR, because it needs to have the people information for CRM. You need to have the CRM information for the finance system. They need to be integrated for that to be a system.

From the discussions, it was evident that innovation was an important factor for the IMS and that it had to be included in the conceptual framework.

5.2.4.9 Standardisation effort

Standardisation effort was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding standardisation effort with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [1]

> Then there's a series of activities that happened during the launch of a system, whether it's to phase or rule out in a very palatable way, making sure you don't break the back of the organisation by doing a big bang approach to actually communicating and actually doing hands-on training or doing any series of things that appeal to people. What we've found is that when you work with a large organisation that's largely client facing, you can't just do once off events, so we spend a lot of time allowing people to do self-training, so they actually self-service themself by consuming online YouTube type content as well as having a series of interventions where people would sign up to attend on a regular basis, versus forcing people and you know impacting their daily lives on their projects.

Interview [6]

> So, our products are as you know, we sell to very large companies, but one thing that we've neglected to do, is the extensive training to the employees that work on our own systems internally. And that is where the biggest problem came in. Training – not on the system per se, but new processes that's got to happen on the system. And that's a big thing. I think in most cases where the system doesn't work is because the guys don't do proper training.

Interview [14]

> So, I'll give you an example right. So, recently we have that Success Factors was a cloud-based solution right. One of the key requirements around that selection for us as an

> organisation, was the fact that it was like a Facebook/LinkedIn/Twitter-type interface, where it was, the biggest problem is, you get these tools and then it's the change management that comes with it right. So, this was a familiar interface to everyone, we never had training on that. None of the leaders, none of the managers, none of the staff had training. Everyone figured it out themselves, because of the way, the nature of how this interface was. But where, obviously I've been through change where we've selected the tool, and I've been through some disastrous ones, where we didn't have, we never thought about change management. People just didn't want to move from what they're used to do.
>
> Self-learning. Okay. Is it something new? Because normally, as you said, traditionally you would have change agents to show the employees that this is how it needs to be done, and the type of training that you'd have to go through.

From the discussions, it was evident that standard effort was an important factor for the IMS and that it had to be included in the conceptual framework.

5.2.4.10 Efficiency

Efficiency was an important factor extracted from the literature review. This factor also informed the conceptual framework. Therefore, it formed an important part of the interviews. Below are extracts from the participants regarding efficiency with respect to IMS. All quotations are reproduced verbatim and unedited.

Interview [1]

> I think that in a digital world where people are intrinsically connected to the Internet, to organisational systems, to technology, that management methods and systems can be overhauled to be much more efficient and effective. I find in many cases that the organisations get it wrong every single time and you always find that the way that systems have been rolled out, I never seem about right, they're always missing something. I think two things: One, we aren't cognisant of us living in an intrinsically connected digital world and certainly like I mentioned earlier, I don't think we put users of the systems at the heart of what the systems need to be.

Interview [2]

> … other side of the equation that we use Power PI very effectively to go fetch data out of whatever part of the data lake and bring it to the user. And because once again of the fact that the ability of something like Power PI to be able to work across platforms, is there now. It actually made life quite a bit easier.

Interview [4]

> The intelligence of that question is what is the desired state in the strategy of the organisation in implementing these systems. Yes, it's for the efficient running and the operations but also as an enabling decision-making process to take you to the next level. If the data, the intelligence, you can't extrapolate the right intelligence off your system it becomes meaningless … I'll make an example, as we move to cloud, we will have certain resistance in terms of whether the market is ready or whether our customers are ready to embrace but if you look at the of cloud that will enable customers' efficiency and agility in getting to the market, you will have your team resisting to take this new strategy forward but if you're talking the leadership as the management and the execution, in showing the value thereof, that adoption becomes more easier. What I normally do, I go with my team to be the voice of presenting to the customer first so that they can see me as the change agent rather than we've got to do it without showing me the way and I will be able to follow, and once they are brought, bought into the solution it becomes easier for them to embrace and take it forward.

The semi-structured face-to-face interviews revealed that the conceptual framework was relevant and the constructs were indeed adding value to the overall research.

Interview [11]

> [W]e have what's called IS [information system] committee. It's not a project committee, it's a collective committee between IS plus business stakeholders, mainly HR, finance, operations. And during this committee, we cover long-running projects, and status updates. And for, as well, we will not start any, even small projects, especially when it comes to integrated systems, without criteria, which is compliance, so we need to make sure we are compliant with the local regulations. It's top line generated, okay, so something will have top line. It's efficiency, ja. So, if it's not one of the three KPIs we'll not go ahead, whereas, despite it's big or small projects. Plus, we can, we will not go without the clear accountability platform from the other side of the business, so if we are doing something with commercial team, we need to have accountable sponsor on the project because of IS is the technical team, okay and between the two parties, they have regular meetings and regular updates, to decide, go or no-go and decide the project's status. And for management level, we are sharing on the IS committee. So IS committee is sharing update, focus update plus decision-making.

From the discussions, it was evident that efficiency was an important factor for the IMS and that it had to be included in the conceptual framework.

The interviews confirmed that the factors for the conceptual framework were indeed relevant and the conceptual framework was a satisfactory framework for the study. The next section presents the quantitative phase of the research.

5.3 SECTION B: QUANTITATIVE ANALYSIS

The purpose of this section is to explain the results of the study. The data presented is from the respondents who answered the online survey.

Phase 2:

The quantitative phase presents the analysis of the raw data.

5.4 TESTS FOR NORMALITY

The Kolmogorov-Smirnov (K-S) and the Shapiro-Wilk tests were used to determine whether the sample data was distributed normally.

H_0 The sample data is not significantly different from a normal population.

H_1 The sample data is significantly different from a normal population.

The results from the Kolmogorov-Smirnov (K-S) and the Shapiro-Wilk tests are illustrated in the table below: Table 25 reflects the results of the tests for normality. A probability of 0.05 or lower for either statistic would have meant that the data was not normally distributed.

Table 5.1: Test for normality

Tests for normality						
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
1. Management						
Knowledge	0.295	206	0.000	0.705	206	0.000
Motivation	0.304	206	0.000	0.711	206	0.000
Accurate reporting	0.275	206	0.000	0.789	206	0.000
Efficiency	0.290	206	0.000	0.742	206	0.000
Transparency	0.226	206	0.000	0.848	206	0.000
Formalised systems	0.247	206	0.000	0.824	206	0.000
Customer benefit	0.282	206	0.000	0.757	206	0.000
Implementation	0.230	206	0.000	0.843	206	0.000
Understanding	0.267	206	0.000	0.835	206	0.000
Staff input	0.0272	206	0.000	0.745	206	0.000

Tests for normality						
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
2. Standards						
Competitiveness	0.295	206	0.000	0.715	206	0.000
Agility	0.294	206	0.000	0.745	206	0.000
Agreement	0.240	206	0.000	0.844	206	0.000
Innovation	0.231	206	0.000	0.839	206	0.000
Consistency	0.303	206	0.000	0.753	206	0.000
3. Leadership						
Objectives	0.237	206	0.000	0.787	206	0.000
Benefits	0.259	206	0.000	0.828	206	0.000
Informed decisions	0.266	206	0.000	0.820	206	0.000
Formalised management processes	0.272	206	0.000	0.799	206	0.000
Motivation	0.255	206	0.000	0.787	206	0.000
Customer satisfaction	0.247	206	0.000	0.802	206	0.000
Stakeholder management	0.242	206	0.000	0.807	206	0.000
Staff input	0.205	206	0.000	0.854	206	0.000
Systems policy	0.289	206	0.000	0.756	206	0.000
Business strategy	0.279	206	0.000	0.762	206	0.000
4. Policy						
Policies documented	0.269	206	0.000	0.750	206	0.000
Policies communicated	0.307	206	0.000	0.733	206	0.000
Implementation	0.236	206	0.000	0.825	206	0.000
Standardised systems	0.241	206	0.000	0.823	206	0.000
Management system policies	0.272	206	0.000	0.754	206	0.000
5. Employee performance						
Efficiency	0.257	206	0.000	.749	206	0.000
Objective	0.314	206	0.000	0.752	206	0.000
Co-ordination	0.283	206	0.000	0.769	206	0.000
Goals	0.275	206	0.000	0.766	206	0.000
Innovation	0.290	206	0.000	0.753	206	0.000
Job control	0.259	206	0.000	0.802	206	0.000
Auditing	0.271	206	0.000	0.806	206	0.000
Teamwork	0.286	206	0.000	0.772	206	0.000
Collective work	0.283	206	0.000	0.747	206	0.000
6. Standardisation effort						
Knowledge transfer	0.194	206	0.000	0.838	206	0.000
Implementation	0.248	206	0.000	0.835	206	0.000

Tests for normality						
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Efficiency	0.261	206	0.000	0.821	206	0.000
7. Organisational culture						
Improving systems	0.283	206	0.000	.0758	206	0.000
Organisational culture by top management	0.292	206	0.000	.0767	206	0.000
Organisational culture for performance	0.262	206	0.000	.0799	206	0.000
High performance culture	0.251	206	0.000	0.800	206	0.000
Organisational strategy	0.240	206	0.000	0.817	206	0.000
8. Innovation						
Analyse	0.293	206	0.000	0.739	206	0.000
Innovation	0.271	206	0.000	0.800	206	0.000
Customer value	0.289	206	0.000	0.793	206	0.000
Focus on processes	0.263	206	0.000	0.796	206	0.000
Innovation	0.280	206	0.000	0.764	206	0.000
Management and strategies	0.281	206	0.000	0.786	206	0.000
Innovation is monitored	0.259	206	0.000	0.827	206	0.000
Continuous improvement	0.255	206	0.000	0.791	206	0.000
9. Employee motivation						
Achieve the goals	0.266	206	0.000	0.769	206	0.000
Challenging objectives	0.303	206	0.000	0.755	206	0.000
Platforms	0.257	206	0.000	0.759	206	0.000
10. Targets						
Change management	0.212	206	0.000	0.824	206	0.000
Management systems	0.249	206	0.000	0.822	206	0.000

The Kolmogorov-Smirnov (K-S) and the Shapiro-Wilk tests indicated that the data was not normally distributed. This means that H_0 was rejected at the 1% level for all the variables and H_1 was accepted for all the variables. The data also indicated that the distributions were highly skewed to the right. The fact that the data was not normally distributed means that non-parametric tests had to be used in this research. Parametric statistical tests assume that the data is normally distributed, and this assumption was violated, therefore parametric tests could not be used.

Table 5.2 below presents the mean scores of the items that measured the different constructs as well as the independent t-test results.

Table 5.2: T-test results

Serial no.	Construct	Sample size	Mean score	SD	t-value	p-value	Decision
1	**Management:** responsible for planning, organising, leading, and controlling resources in the organisation.	220	5.300	1.800	40.100	0.000	Reject
2	**Standards:** a set of guidelines, principles, procedures or work instructions introduced by management and executed at operational level.	220	5.200	1.800	10.500	0.000	Reject
3	**Leadership:** senior management of an organisation that sets the vision and direction of the organisation**.**	220	5.200	1.800	10.100	0.000	Reject
4	**Policy:** expressed by leaders in an organisation through a formal documented process.	220	5.300	1.900	10.100	0.000	Reject
5	**Employee performance:** the act of showing positive or negative results in an organisation.	220	5.300	1.900	10.600	0.000	Reject
6	**Standardisation effort:** the amount of energy and determination used to obtain a goal.	220	5.000	1.800	8.500	0.000	Reject
7	**Culture:** the beliefs, morals and values an organisation exhibits	220	5.300	1.800	10.600	0.000	Reject
8	**Innovation:** the act of invention or modernisation of processes and systems	220	5.300	1.800	10.400	0.000	Reject
9	**Employee motivation:** the drive and inspiration to achieve organisational objectives.	220	5.300	1.900	10.200	0.000	Reject
10	**Targets:** the drive and inspiration to achieve organisational objectives.	220	5.0	2.0	10.2	0.000	Reject

Note: SD = standard deviation

All the mean scores were above 4.0, which implied that the participants generally agreed with the statements. This was a two-sided t-test. The null hypothesis had to be rejected and the alternative, which says that the mean score is not equal to 4.0, had to be accepted. But because the mean scores were above 4.0, this meant that the alternative hypothesis, namely that the participants agreed with the statement, had to be accepted.

5.5 RESPONSE RATE

The response rate for the survey questionnaire that was completed by the participants is presented below.

Table 5.3: Response rate

Target population	Received	Rejected	Percentage response	Accepted population
500	220	0	44.000	220

Table 5.3 indicates the response rate received was considered acceptable for the purpose of this research (Strydom & De Vos, 1998) (see also 4.7). The data collection period was over three weeks. Reminders were sent to the participants weekly for the period whilst it was online. The response rate might have been better, but many participants indicated that work load constraints had restricted their time to participate.

5.6 STATISTICAL DATA ANALYSIS OF PARTICIPANTS

This part of the chapter consists of two sections: the first section (section A) being the background information of the participants and the second section (section B) being the data analysis, results and discussion.

5.7 SECTION C: DESCRIPTIVE ANALYSIS

The purpose of this section is to explain the descriptive statistics.

A1: What is your employment status?

There were a total of 220 participants. Of the 220 participants, 202 (91.8%) had a permanent employment status, and 15 (6.8%) were working on contract for the organisations.

A2: What is the total number of years you have been employed?

Table 5.4: Total number of years employed

Total number of years employed	Frequency	Percentage (%)	Cumulative percentage
1-10	92	41.800	41.800
11-20	83	37.700	79.500
21-30	32	4.500	94.100
31-40	10	1.500	98. 600
41-50	3	1.400	100.000
Total	220	100.000	

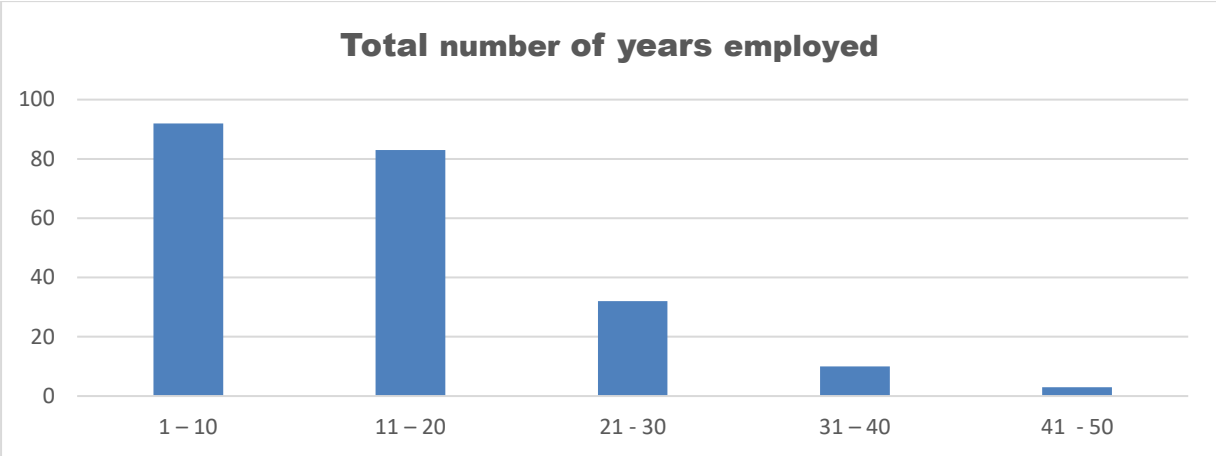

Figure 5.2: Total number of years employeed

Table 5.4 and Figure 5.2 show that the majority of participants (almost 80%) had been employed for up to 20 years. This indicates that the sample had a good understanding of the management systems of their organisations and how these systems functioned in their area of work.

A3: Indicate the total number of years you have been employed in your current position

Table 5.5: Number of years in current position

Number of years in current position	Frequency	Percentage (%)	Cumulative percentage
1-10	191	86.800	80.800
11-20	26	11.800	98.600
21-30	2	0.900	99.500
31-40	1	0.500	100.000
Total	220	100.00	

Figure 5.3 below illustrates the distribution more clearly.

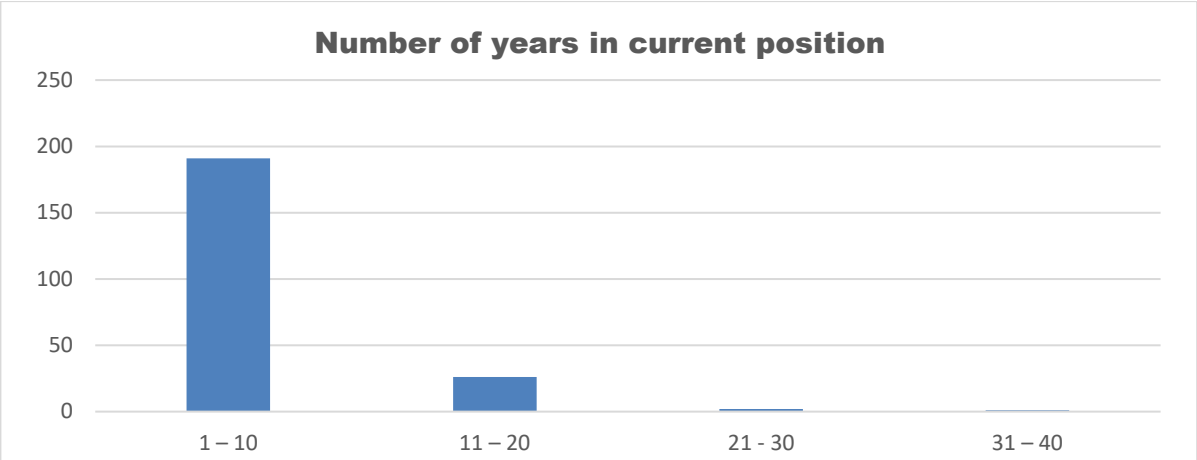

Figure 5.3: Number of years in current position

The number of years or tenure was also analysed. Table 5.5 and Figure 5.3 show that in total, 217 of the participants (98.6%) had been in their current positions for the preceding 20 years. This indicated that the participants sampled had knowledge and experience regarding management systems in their organisations.

A4: When working on systems, at which of the following levels do you perform?

Table 5.6: Level of management system being utilised by participants

Number	Area	Frequency	Percentage (%)
1	User	105	47.700
2	Management	79	35.900
3	Technical support	36	16.400
4	Other (please specify)		
Total		220	100.000

Figure 5.4 below illustrates the distribution more clearly.

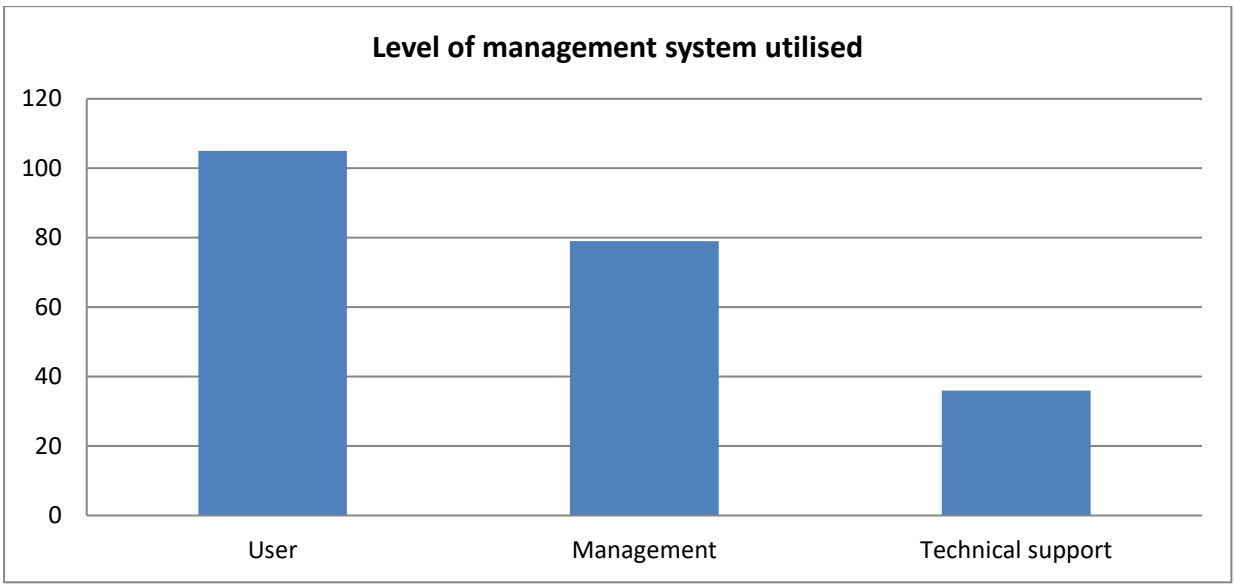

Figure 5.4: Level of management system utilised

For this research, all participants were targeted because they contributed to the IMS in some way, for example by implementation or utilisation of the systems. Table 5.6 and Figure 5.4 show the levels performed being utilised by the participants in their organisations. There were 105 (47%) users of management systems, 79 (35.9%) of management, and 36 (16.4%) participants from technical support. This indicates that over 80% of the participants were active in the use of management systems in their organisations, which is a good indication of the challenges and benefits of integration of management systems.

A5: Please select your highest qualification

Table 5.7: Highest education achieved

Number	Highest qualification	Frequency	Percentage (%)
1	Grade12 (Matric/National Senior Certificate)	13	5.900
2	Higher certificate	7	3.200
3	Diploma or advanced certificate	54	24.500
4	Bachelor's degree or advanced certificate	82	37.300
5	Honours degree, postgraduate diploma or professional qualification	33	15.000
6	Master's degree	28	12.700
7	Doctoral degree	1	0.500
8	Other (please specify)	2	-
Total		220	100.000

Table 5.7 and Figure 5.5 show the highest education distribution.

Figure 5.5: Highest qualification

From the graph, it was clear that the majority of the participants had a bachelor's degree (37.3%), a diploma or advanced certificate (24.5%) or an honours degree (15.0%). It is interesting to note that a doctorate employee also answered the questionnaire. From the information presented, it was clear that over 65% had a degree or postgraduate qualification, which indicated that the participants were knowledgeable and educated in their organisation. Furthermore, it could be deduced that employees understood the research that was being conducted with regard to integration of management systems.

5.7.1 Factor analysis results

In this section, the results of the factor analysis to test for construct validity are discussed. Typical reasons why constructs may not be valid are (Hair et al., 1995):

- inappropriate selection of measures or items;
- insufficient data collected to make valid conclusions;
- measurement done in too few contexts;
- measurement done with too few measurement variables or items;
- too great a variation in data;
- inadequate selection of target subjects or small sample size;
- complex interaction across constructs;
- participants giving biased answers or trying to guess what they should say; and
- experimental method not valid or research lacking rigour.

The reliability of the constructs was also investigated. Reliability refers to the accuracy and precision of a measurement procedure (Hair et al., 1995). Reliability may be viewed as the

relative lack of error of an instrument. As explained by Serumaga-Zake (2014), reliability can be assessed by repeating the same test or measure (test-retest), by administering an equivalent form (parallel test forms), by using single-administration methods, by subdividing the test into two or more equivalent parts, or by looking at internal consistency as measured with Cronbach's coefficient alpha. This current research used the Cronbach's alpha statistic generated by the Statistical Package for Social Scientists (SPSS) to measure reliability.

In the current research, Cronbach's alpha coefficients greater than 0.7 were accepted. Cronbach's alpha is a measurement of the variance within an item and the co-variance between a particular item and any other item on the scale (Field 2005). All the alpha coefficient estimates were above 0.7, which implied that the data was reliable.

Confirmatory factor analysis (CFA), an extension of factor analysis in which specific hypotheses about the structure of the factor loadings and inter-correlations are tested (see Hair et al., 1995) was done. CFA tests whether a specified set of constructs is influencing responses as hypothesised. Both types of factor analyses are based on the common factor model (see Field 2005). Factor analysis is performed by examining the pattern of correlations (or covariances) between the observed measures. Measures that are highly correlated (either positively or negatively) are likely influenced by the same factors, while those that are relatively uncorrelated are likely influenced by different factors (Field 2005).

Variance explained criteria – some researchers simply use the rule of keeping enough factors to account for 90% or 80% of the variation (Field 2009). Where the researcher's goal emphasises parsimony (explaining variance with as few factors as possible), the criterion could be as low as 50% (Hair et al., 1995). Before dropping a factor below one's cut-off, however, the researcher should check its correlation with the dependent variable (Field 2009). A very small factor could have a large correlation with the dependent variable, in which case it should not be dropped (Field 2005).

For factor analysis to be done properly, one needs anywhere from 3 to several hundred variables, but most often between 10 and 100 (Field 2009). For factor analysis to be valid, the sample used must be random and a good representative of the target population (Hair et al., 1995). The minimal number of cases for reliable results is more than 100 observations and at least 5 times the number of questions or variables population (Hair et al., 1995).

Since some subjects may not answer every question, a larger sample is desirable (Serumaga-Zake, 2014). For example, 30 items would require at least 150 cases (5x30), a sample of 200 subjects would allow for missing data (Serumaga-Zake, 2014). The maximum likelihood method (see Hair et al., 1995) was used to extract the factors from the correlation matrix. For

factor analysis, the Kaiser-Meyer-Olkin (KMO) test was used to measure sampling adequacy. The KMO test is an index that is used to compare the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients (see Arbuckle, 2007). The KMO value should be greater than 0.5 for a satisfactory factor analysis to proceed (Hair et al., 1995). Large values for the KMO measure indicate that a factor analysis of the variables is justified (Hair et al., 1995). Bartlett's test of sphericity (see Field, 2009) was used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated.

SEM was also done as mentioned in Chapter 4 (see 4.7.2.4). According to Serumaga-Zake (2014), in SEMs the researcher states the way he or she believes the variables are inter-related, often with the use of a path diagram. Then he or she works out, via some complex internal rules, what the implications of this are for the variances and covariances of the variables. The researcher then tests whether the variances and covariances fit this model. Following that, the results of the statistical testing, the parameter estimates and standard errors for the numerical coefficients in the linear equations are reported (Arbuckle, 2007). On the basis of this information, the researcher then decides whether the model seems like a good fit to the data. Confirmatory factor analysis (CFA) models contain only the measurement part, while path diagrams have the structural part Arbuckle, 2007).

The descriptive statistics for the overall integration of management systems are presented in Table 5.8.

5.7.2 Response statistics

Table 5.8 below shows the response statistics and reliability analysis for the integration of management systems in organisations.

Table 5.8: Response and reliability for IMS in organisations

B1	**Management**										
		Likert-type scale responses							**Overall reliability = 0.965**		
Question	Item	1	2	3	4	5	6	7	Mean	SD	Cronbach's alpha coefficient
1	Management should demonstrate knowledge of implementing management systems.	35	6	8	6	16	28	121	5.390	2.274	0.959
2	In my opinion, management should motivate employees to use organisational systems.	13	31	3	2	13	47	111	5.510	2.066	0.959
3	Management should understand that multiple management systems are important for accurate reporting.	16	17	28	7	10	45	96	5.260	2.079	0.963
4	Efficiency should be a driver for management during the implementation of multiple systems.	12	29	10	1	16	47	105	5.440	2.048	0.960
5	Management uses multiple systems to ensure transparency in the organisation.	16	18	26	16	21	45	77	5.050	2.021	0.962
6	Management uses formalised systems to enable organisational goals.	8	28	19	13	20	47	85	5.210	1.965	0.961
7	Management should incorporate systems to produce a product or service that benefits the customer.	13	17	17	3	18	49	100	5.510	1.954	0.961

8	Multiple management systems should be developed and implemented by management consistently.	16	36	13	11	25	51	68	4.880	2.098	0.963
9	I understand the operating of multiple management systems in my organisation.	21	19	22	11	18	61	67	4.990	2.071	0.966
10	Management should encourage input from staff regarding management systems implementation.	15	21	8	2	25	47	102	5.490	1.989	0.960

B2	Standards	Overall reliability = 0.931									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficient
		1	2	3	4	5	6	7			
1	Standards should be seen as improving the competiveness of the organisation.	30	12	8	4	15	41	110	5.380	2.215	0.903
2	Standards should be seen as improving agility in an organisation.	9	29	13	4	17	49	99	5.420	1.993	0.903
3	There is an agreement of standards implementation process in the organisation.	12	16	30	15	24	51	72	5.120	1.919	0.916
4	Standards are seen as stifling innovation in the organisation.	15	32	21	13	23	42	74	4.900	2.100	0.945
5	Standards improve consistency in process performance.	19	16	17	6	12	53	96	5.370	2.064	0.907

B3	Leadership	Overall reliability = 0.965									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	Leadership uses management systems to set objectives for the organisation.	35	7	20	10	22	31	93	5.030	2.268	0.961
2	In my opinion, leadership have recognised the benefits of implementing management systems in organisations.	8	40	12	10	24	64	62	5.000	1.983	0.963
3	I believe that leadership should be making informed decisions by using management systems.	15	10	29	6	24	61	75	5.240	1.911	0.962
4	In my opinion, leadership should develop formalised management processes to address multiple systems.	13	34	14	4	20	56	79	5.110	2.079	0.961
5	Leadership should utilise the benefits of management systems to keep employees motivated.	24	11	18	3	27	47)	90	5.250	2.085	0.960
6	I believe leadership utilises management systems to improve customer satisfaction.	11	27	19	11	18	41	93	5.230	2.039	0.961
7	I believe that management systems enable stakeholder management.	8	20	24	4	28	45	91	5.360	1.896	0.960
8	Leadership encourages input from staff regarding management systems implementation.	10	32	19	17	28	40	74	4.970	2.004	0.963

9	In my opinion, a policy for the management of systems is important.	18	18	16	5	15	46	102	5.380	2.074	0.959
10	In my opinion, the business strategy should be aligned to organisational culture.	14	22	17	3	18	45	101	5.390	2.038	0.962
B4	**Policy**	**Overall reliability = 0.940**									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	Policies documented are driven at leadership level.	40	8	12	8	16	34	102	5.080	2.352	0.930
2	Policies should be effectively communicated throughout the organisation.	7	35	11	2	12	55	98	5.440	2.006	0.921
3	Multiple policies are facilitated during implementation in the organisation.	16	12	28	8	26	45	84	5.220	1.980	0.928
4	New policies are introduced through standardised systems by management.	7	37	18	9	23	50	75	5.080	2.003	0.927
5	Management system policies should be applied consistently throughout the organisation.	24	13	14	3	21)	43	101	5.360	2.123	0.923

B5	Performance	Overall reliability = 0.977									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	Multiple management systems should improve efficiency in the organisation.	38	15	9	3	21	29	105	5.080	2.373	0.977
2	Setting objectives should drive organisational performance.	10	34	10	1	12	61	90	5.340	2.049	0.973
3	Co-ordination of organisational goals improves performance.	10	8	30	0	20	57	95	5.560	1.821	0.975
4	In my opinion, controlling organisational goals improves performance.	6	34	12	6	19	46	96	5.380	1.985	0.974
5	Innovation should be seen as an enabler for improving performance in the organisation.	17	14	21	3	17	48	100	5.430	2.027	0.975
6	In my opinion management systems allows for more control over my job.	12	28	17	5	25	49	84	5.220	2.022	0.974
7	Management systems auditing should improve the organisation's performance.	15	19	19	6	24	56	81	5.260	1.988	0.974
8	In my opinion, management systems should contribute positively to team performance.	12	23	18)	2	19	54	92	5.380	1.994	0.974
9	I believe that achieving results are the collective work of all structures within the organisation conforming to the predefined goals of the organisation.	13	21	19	1	16	46	104	5.450	2.025	0.974

B6	Standardisation effort	Overall reliability = 0865									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	The effort of knowledge transfer is good in our organisation.	36	17	13	21	24	31	77	4.740	2.273	0.872
2	Multiple management systems implementation should be executed at operational level.	9	38	15	6	27	59	65	5.010	1.999	0.774
3	The effort in formalising systems should improve organisational efficiency.	10	10	30	6	26	59	78	5.360	1.815	0.799
B7	Organisational culture	Overall reliability = 0.952									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	There must be a culture of improving systems in the organisation.	28	11	12	4	19	49	96	5.330	2.138	0.938
2	The organisational culture should be enabled by top management.	6	34	8	5	20	61	86	5.410	1.909	0.935
3	Organisational culture must be the driver for improved performance.	13	11	23	6	26	55	85	5.400	1.877	0.936

4	A high performance culture is an enabler for performance of multiple management systems in the organisation.	6	33	14)	6)	26	51	84	5.290	1.936	0.936
5	In my opinion, the organisational culture is aligned to organisational strategy.	26	**13**	16	11	25	50	79	5.110	2.094	0.958
B8	**Innovation**	**Overall reliability = 0.967**									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	In my opinion, management should analyse the organisational human resources in order to create a more fertile ground for the implementation of innovation.	28	10	14	1	18	51	95	5.320	2.165	0.960
2	The environment for innovation must be set by top management.	12	26	11	9	23	59	80	5.280	1.952	0.963
3	In my opinion, superior customer value is created through innovation in the organisation.	10	17	25	1	22	65	80	5.390	1.856	0.962
4	The organisation's management should put significantly more focus on processes in order to address innovation issues regularly.	12	26	15)	4	26	51	85	5.270	1.986	0.962
5	Management should enable a process for innovation by providing platforms for such undertakings.	24	9	17	6	19	50	95	5.360	2.061	0.960

6	In my opinion, we need management and strategies for innovation in the organisation.	6	32	14	5	20	58	85	5.350	1.927	0.961
7	Innovation is monitored through formalised processes in the organisation by management.	18	15	31	11	16	50	79	5.080	2.057	0.966
8	In my opinion, innovation is used as a tool for continuous improvement in the organisation.	11	31	16	8	21	40	92	5.220	2.066	0.968
B9	**Motivation**	**Overall reliability = 0.909**									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	I am motivated to achieve the goals of the organisation.	31	12	23	4	13	34	102	5.130	2.285	0.881
2	Management must set challenging objectives for its employees to meet organisational goals.	8	32	11	2	14	59	94	5.420	1.979	0.875
3	I believe that management should enable platforms for job enrichment.	19	11	19	0	23	37	107	5.450	2.032	0.851

B10	Targets	Overall reliability = 0.809									
		Likert-type scale responses							Mean	SD	Cronbach's alpha coefficients
		1	2	3	4	5	6	7			
1	Targets are introduced via change management processes.	35	14	14	15	25	38	79	4.870	2.248	0.809
2	I believe that incorporation of multiple management systems is difficult in the organisation.	16	31	16	6	24	50	77	5.040	2.097	0.809

5.8 DISCUSSION OF EACH CONSTRUCT RELIABILITY

5.8.1 Leadership

Ten variables were used to measure the construct 'leadership'. The mean values were between 5.390 and 4.970. This implies that most participants agreed with the statements. The statement "In my opinion, the business strategy should be aligned to organisational culture" had a mean of 5.390 which implies that leaders should align their strategy with organisational culture, which is an important ingredient for the operations of implementation of management systems. Furthermore, the lower mean values of 4.970 reflected the content variable "Leadership encourages input from staff regarding management systems implementation". Although on the lower mean value for this construct, this is an important item. Leadership must involve employees when taking decisions on the implementation of management systems as the employees are the individuals who will be implementing and working with these systems. This implies that the management construct appeared to have good reliability. Table 5.9 shows Cronbach's alpha index if an item was deleted. The results indicate that removing any of the items from the scale would not have improved the Cronbach's alpha index for the construct significantly.

Table 5.9: Reliability statistics for leadership

Item-total statistics				
Overall Cronbach's alpha index = 0.965		**Number of items**		
		10		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Knowledge	47.340	252.512	0.896	0.959
Motivation	47.220	258.028	0.906	0.959
Accurate reporting	47.480	264.536	0.792	0.963
Efficiency	47.290	259.757	0.886	0.960
Transparency	47.690	263.958	0.828	0.962
Formalised systems	47.530	264.886	0.839	0.961
Customer benefit	47.230	263.680	0.865	0.961
Implementation	47.860	263.229	0.805	0.963
Understanding	47.750	269.302	0.718	0.966
Staff input	47.250	261.729	0.881	0.960

5.8.2 Management

Ten variables were used to measure the construct 'management'. The mean values were between 5.510 and 4.880, which indicates that most participants agreed with the statements. The highest Cronbach's alpha coefficients reflect the following:

- use of management systems to enable accurate reporting (0.963);
- transparency (0.962);
- the use of formalised systems to make decisions (0.961);
- creating customer benefit (0.961); and
- input from staff as the variables with highest alpha index (0.960).

The results indicate that the management construct appeared to have good reliability. Table 5.10 illustrates Cronbach's alpha if an item is deleted. The results indicate that removing any one of the items on the scale would not have significantly improved the Cronbach's alpha index for the construct.

Table 5.10: Reliability statistics for management

Item-total statistics				
Overall Cronbach's alpha index = 0.965		**Number of items**		
		10		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Knowledge	47.340	252.512	0.896	0.959
Motivation	47.220	258.028	0.906	0.959
Accurate reporting	47.480	264.536	0.792	0.963
Efficiency	47.290	259.757	0.886	0.960
Transparency	47.690	263.958	0.828	0.962
Formalised systems	47.530	264.886	0.839	0.961
Customer benefit	47.230	263.680	0.865	0.961
Implementation	47.860	263.229	0.805	0.963
Understanding	47.750	269.302	0.718	0.966
Staff input	47.250	261.729	0.881	0.960

5.8.3 Standards

Five variables were used to measure the construct standards. The mean values were between 5.420 and 4.900. This implies that most participants agreed with the statements. The content

variable which reflected the 5.420 mean value was “Standards should be seen as improving agility in an organisation”. This variable had a significantly high impact on the overall construct standards. Furthermore, the lower mean value of 4.900 reflected the variable “Standards are seen as stifling innovation in the organisation”. Although this variable had a lower mean value, it also had the highest Cronbach’s alpha (0.945). This implies that standards were seen by participants as stifling innovation in an organisation, which contradicts the theory as explained in Chapter 3 (see 3.7.1) Table 5.11 shows the Cronbach’s alpha if an item is deleted. The results indicate that removing any of the items from the scale would not have significantly improved the Cronbach’s alpha index for the construct.

Table 5.11: Reliability statistics for standards

Overall Cronbach’s alpha index = 0.931		**Number of items**		
		5		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach’s alpha if item deleted
Competitiveness	20.820	50.517	0.883	0.903
Agility	20.770	53.526	0.882	0.903
Agreement	21.080	56.090	0.816	0.916
Innovation	21.290	57.685	0.663	0.945
Consistency	20.830	53.080	0.860	0.907

5.8.4 Policy

Five variables were used to measure the construct ‘policy’. The mean values were between 5.440 and 5.080, which means that most participants agreed with the statements. The content variable which measured 5.440 was “Policies should be effectively communicated throughout the organisation”. This variable had a significantly high impact on the overall construct ‘policy’ as it reflected that organisations must disseminate and communicate the policy for the IMS to be effective. Furthermore, the lower mean value of 5.080 reflected the variable “New policies are introduced through standardised systems by management”. Although this variable has a low mean, interestingly had a significant impact, as the IMS needs to be introduced via standardised methods or processes (Bernado et al., 2012). The highest value of the Cronbach’s alpha indexes was 0.930 and the lowest was 0.923, which indicates good reliability. Table 5.12 shows the Cronbach’s alpha if an item is deleted. The results indicated that removing any of the items from the scale would not have significantly improved the Cronbach’s alpha index for the construct.

Table 5.12: Reliability statistics for policy

Item-total statistics				
Overall Cronbach's alpha index = 0.940		**Number of items**		
		5		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Policies documented	21.100	54.447	0.826	0.930
Policies communicated	20.740	58.100	0.867	0.921
Implementation	20.960	59.473	0.826	0.928
Standardised systems	21.100	59.083	0.830	0.927
Management system policies	20.820	56.805	0.854	0.923

5.8.5 Employee performance

Nine variables were used to measure the construct 'performance'. The mean values were 5.560 and 5.080, which means that most participants agreed with the statements The content variable which reflects the 5.560 mean value was "Co-ordination of organisational goals improves performance". This content variable had a significantly high impact on the overall construct performance as reflected in Chapter 2 (see 2.12.4), that co-ordination of organisation goals improves the performance of employees. Furthermore, the lower mean value of 5.080 reflects the content variable "management systems should improve efficiency in the organisation". Although this variable is on lower mean value does contribute significantly in terms of the Cronbach alpha index of 0.923, which is an important index as it relates positively and indicates that IMS improve efficiency in an organisation. Overall, the highest Cronbach alpha for this construct is 0.977 and the lowest Cronbach alpha is 0.973 which indicates good reliability for the construct performance. Table 5.13 indicates the Cronbach alpha if an item is deleted. The results indicate that removing any of the items from the scale would not have significantly improved the Cronbach alpha index for the construct.

Table 5.13: Reliability statistics for employee performance

Item-total statistics				
Overall Cronbach's alpha index = 0.977		**Number of items**		
		9		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's Alpha if item deleted
Efficiency	43.000	218.300	0.859	0.977
Objective	42.730	223.035	0.930	0.973
Co-ordination	42.520	231.615	0.888	0.975
Goals	42.700	225.650	0.915	0.974
Innovation	42.650	225.492	0.896	0.975
Job control	42.860	224.924	0.909	0.974
Auditing	42.820	225.939	0.908	0.974
Teamwork	42.700	226.028	0.903	0.974
Collective work	42.620	225.323	0.900	0.974

5.8.6 Standardisation effort

Three variables were used to measure the construct standardisation effort. The results of the construct 'standardisation effort' had mean values between 5.010 and 4.740, which means that most participants agreed with the statements. The variable which reflected a 5.010 mean value was "Multiple management systems implementation should be executed at operational level". This variable had a significantly high impact on the overall construct performance as it is important that the IMS be implemented and operationalised to ensure that efficiency in an organisation is realised. Furthermore, the lower mean value of 4.740 reflected the variable "The effort of knowledge transfer is good in our organisation". Organisations must expend energy and time to ensure that an IMS is implemented systematically through focused effort, for example training and skills transfer methods. The highest Cronbach's alpha index for this construct was 0.872 and the lowest was 0.774, which indicates good reliability. Table 5.14 shows the Cronbach's alpha index if an item is deleted. The results indicate that removing any of the items from the scale would not have significantly improved the Cronbach alpha index for the construct.

Table 5.14: Reliability statistics for standardisation effort

Item-total statistics				
Overall Cronbach's alpha index = 0.867		**Number of items**		
		3		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Knowledge transfer	10.370	12.923	0.700	0.872
Implementation	10.100	13.806	0.790	0.774
Efficiency	9.750	15.260	0.774	0.799

5.8.7 Organisational culture

Five variables were used to measure the construct 'organisational culture'. The results of the construct 'organisational culture' had mean values between 5.410 and 5.110, which means that most participants agreed with the statements. The variable, which measured 5.410 was "The organisational culture should be enabled by top management", was significant as organisational culture should be enabled by top management as described in the literature (see 2.14). Furthermore, the low mean value of 5.110 as reflected by the statement "In my opinion, the organisational culture is aligned to organisational strategy", was also significant and indicated that for an IMS to be implemented the organisational culture and strategy should be aligned. All the Cronbach's alpha indexes were high and significant. Table 5.15 shows the Cronbach's alpha index if an item is deleted. The results indicated that removing any of the items would not have significantly improved the Cronbach's alpha index for the construct.

Table 5.15: Reliability statistics for organisational culture

Item-total statistics				
Overall Cronbach's alpha index = 0.952		**Number of items**		
		5		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Improving systems	21.220	51.608	0.885	0.938
Organisational culture by top management	21.130	54.300	0.903	0.935
Organisational culture for performance	21.150	54.900	0.897	0.936
High performance culture	21.250	54.088	0.897	0.936
Organisational strategy	21.440	55.067	0.770	0.958

5.8.8 Innovation

Eight variables were used to measure the construct ‘innovation’. The results of the construct ‘innovation’ showed mean values between 5.390 and 5.080, which implied that most participants agreed with the statements. The variable which reflected the 5.390 mean value was “In my opinion, superior customer value is created through innovation in the organisation”. This variable had a significantly high impact on the overall construct ‘innovation’ as related to the literature (see 2.15). Furthermore, the low mean value of 5.080 reflected the variable “Innovation is monitored through formalised processes in the organisation by management”. Although this was the low mean value, innovation should have platforms for it to flourish as discussed (see 2.15.6 and 3.8.4). The IMS will become more effective and improve efficiency when introduced through formalised processes. The highest Cronbach’s alpha index for this construct was 0.968 and the lowest Cronbach’s alpha was 0.960, which indicates good reliability. Table 5.16 shows the Cronbach’s alpha index if an item is deleted. The results show that removing any of the items from the scale would not have improved the Cronbach’s alpha index for the construct significantly.

Table 5.16: Reliability statistics for innovation

Item-total statistics				
Cronbach’s alpha index = 0.967		**Number of items**		
		8		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach’s alpha if item deleted
Analyse	36.950	156.334	.914	.960
Customer value	36.990	163.673	.861	.963
Customer value	36.880	164.673	.890	.962
Focus on processes	37.000	161.556	.891	.962
Innovation	36.920	158.600	.918	.960
Management and strategies	36.930	162.135	.910	.961
Innovation is monitored	37.200	163.700	.809	.966
Continuous improvement	37.050	164.731	.783	.968

5.8.9 Employee motivation

Three variables were used to measure the construct ‘employee motivation’. The mean values were between 5.450 and 5.130, which means that most participants agreed with the statements. The variable which reflected the 5.450 mean value was “I believe that

management should enable platforms for job enrichment". This variable had a significantly high impact on the overall construct motivation. Furthermore, a low mean value of 5.080 was reflected for the variable "I am motivated to achieve the goals of the organisation". It is reflected in the literature (see Boys and Wilcock, 2014) that employee motivation is an important construct with respect to an IMS as this is for employee and employer to display an environment that is conductive to achieving organisational goals and in turn improving the efficiency in the organisation. The Cronbach's alpha indexes show that the highest value for this construct was 0.881 and the lowest was 0.851 which indicates good reliability. Table 5.17 shows the Cronbach's alpha if an item is deleted. The results indicate that removing any of the items from the scale would not have improved the Cronbach's alpha index for the construct significantly.

Table 5.17: Reliability statistics for employee motivation

Item-total statistics				
Cronbach's alpha index = 0.909		**Number of items**		
		3		
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Achieve the goals	10.870	14.378	0.811	0.881
Challenging objectives	10.580	16.631	0.812	0.875
Platforms	10.550	15.909	0.840	0.851

5.8.10 Targets

Two variables were used to measure the construct 'targets'. The mean values were between 5.040 and 4.870, which means that most participants agreed with the statements. The variable which reflected the 5.040 mean value was "The incorporation of multiple management systems is difficult in the organisation". This variable had a significantly high impact on the overall construct targets as most employees agreed that it is difficult to implement multiple management systems. Furthermore, the lower mean value of 5.080 was reflected by the variable "Targets are introduced via change management processes". Although this was the lower mean value, it is significant as management should introduce the IMS through change management concepts and methodologies, as reflected in the literature (see 2.7.5). The Cronbach's alpha indexes for this construct is 0.809 which indicates good reliability. Table 5.18 shows Cronbach's alpha if an item was deleted.

Table 5.18: The reliability statistics for targets

Reliability statistics	
Cronbach's alpha	N of Items
0.809	2

From Table 5.18, there is no need for Cronbach's alpha index if the item is deleted.

5.9 FACTOR ANALYSIS

The following results were obtained for KMO and Bartlett's test.

Table 5.19: KMO and Bartlett test results

Kaiser-Meyer-Olkin measure of sampling adequacy		0.977
Bartlett's test of sphericity	Approx. chi-square	18751.282
	df	1770
	Sig.	0.000

The value of KMO was 0.977> 0.500, which indicates that the factor analysis of the variables was justified, and the Bartlett's test of sphericity value of 18751.282 was highly significant at the 1% level. This indicates that the null hypothesis, which stated that the variables in the population correlation matrix are uncorrelated, was rejected and the alternative hypothesis, which said that they are correlated, was accepted.

5.10 COMMUNALITIES

Table 5.20 shows the communalities for the variables. Factor analysis estimates how much of the variability in a variable is due to common factors ('communality'). In other words, the communality measures the percentage of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the variable (Hair et al., 1995).

Table 5.20: The communalities for the variables

Communalities	**Initial**	**Extraction**		**Initial**	**Extraction**
Objectives	0.808	0.750	Efficiency	0.759	0.758
Benefits	0.735	0.616	Objectives	0.883	0.883
Informed decisions	0.739	0.681	Co-ordination	0.823	0.813
Formalised management processes	0.743	0.708	Goals	0.851	0.854
Motivation	0.793	0.812	Innovation	0.836	0.827
Customer satisfaction	0.770	0.741	Job control	0.860	0.848
Stakeholder management	0.832	0.827	Auditing	0.857	0.846

Communalities	Initial	Extraction		Initial	Extraction
Staff input	0.695	0.664	Teamwork	0.831	0.835
Systems policy	0.833	0.834	Collective work	0.824	0.830
Business strategy	0.718	0.717	Knowledge transfer	0.491	0.560
Knowledge	0.851	0.854	Implementation	0.651	0.804
Motivation	0.898	0.886	Efficiency	0.631	0.749
accurate reporting	0.711	0.633	Improving systems	0.790	0.802
Efficiency	0.840	0.824	Organisational culture by top management	0.854	0.888
Transparency	0.787	0.674	Organisational culture for performance	0.860	0.890
Formalised systems	0.799	0.710	Analyse	0.866	0.884
Customer benefit	0.787	0.791	Innovation	0.795	0.789
Implementation	0.720	0.631	Customer value	0.831	0.834
Understanding	0.557	0.529	Focus on processes	0.833	0.842
Staff input	0.836	0.828	Innovation	0.878	0.888
Competitiveness	0.855	0.906	Achieve the goals	0.660	0.745
Agility	0.826	0.873	Challenging objectives	0.665	0.752
Agreement	0.670	0.690	Platforms	0.706	0.824
Innovation	0.467	0.434	Change management	1	0.464
Consistency	0.764	0.792	Management systems	1	0.464
Policies documented	0.702	0.729	Implementation	0.721	0.745
Policies communicated	0.780	0.821	Standardised systems	0.709	0.722
Management system policies	0.741	0.794			

Variables with a communality of 0.300 as the cut-off point were excluded from further analysis. The results indicated that the minimum communality was 0.434, which was above the cut-off point.

The factor matrix identified by Table 5.21 below presents the factors that have emanated from the factor analysis of the IMS in organisations.

Table 5.21: Composition of the significant factors – factor analysis for IMS in organisations

Factors	1	2	3	4	5	6	7	8	9	10
Management										
Knowledge	0.924									
Motivation	0.942									
Accurate reporting	0.796									
Efficiency	0.908									
Transparency	0.821									
Formalised systems	0.843									
Customer benefit	0.889									
Implementation	0.794									
Understanding	0.727									
Staff input	0.910									
Standards										
Competitiveness		0.952								
Agility		0.934								
Agreement		0.831								
Innovation		0.659								
Consistency		0.890								
Leadership										
Objectives			0.866							
Benefits			0.785							
Informed decisions			0.825							
Formalised			0.842							

Factors	1	2	3	4	5	6	7	8	9	10
management processes										
Motivation			0.901							
Customer satisfaction			0.861							
Stakeholder management			0.910							
Staff input			0.815							
Systems policy			0.913							
Business strategy			0.847							
Policy										
Policies documented				0.854						
Policies communicated				0.906						
Implementation				0.863						
Standardised systems				0.849						
Management system policies				0.891						
Performance										
Efficiency					0.871					
Objective					0.940					
Co-ordination					0.902					
Goals					0.924					
Innovation					0.909					
Job control					0.921					
Auditing					0.920					

Factors	1	2	3	4	5	6	7	8	9	10
Teamwork					0.914					
Collective work					0.911					
Standardisation effort										
Knowledge transfer						0.748				
Implementation						0.897				
Efficiency						0.865				
Culture										
Improving systems							0.896			
Organisational culture by top management							0.942			
Organisational culture for performance							0.943			
High performance culture							0.922			
Organisational strategy							0.776			
Innovation										
Analysis								0.940		
Customer value								0.888		
Customer value								0.913		
Focus on processes								0.918		
Continuous improvement								0.942		

Factors	1	2	3	4	5	6	7	8	9	10
Motivation										
Achieving the goals									0.863	
Challenging objectives									0.867	
Platforms									0.908	
Targets										
Change management										0.809
Management systems										0.809

It is important to note that all the sub-constructs or variables informed the main constructs. Hence, the 10 factors below have contributed to the developed framework for the IMS presented in 5.1.2 and were the final factors for the IMS process, was namely management, standards, leadership, organisational culture, employee performance, employee motivation, policy, standardisation effort, innovation and efficiency that informed the hypothesis tests.

5.11 HYPOTHESIS TESTING

This research sought to evaluate and examine which factors are involved with the integration of management systems. It further sought to test the following hypotheses:

Hypothesis 1

H_0^1 There is no relationship between organisational efficiency and policy.

H_1 There is a relationship between organisational efficiency and policy.

Hypothesis 2

H_0^2 There is no relationship between organisational culture and organisational efficiency.

H_2 There is a relationship between organisational culture and organisational efficiency.

Hypothesis 3

H_0^3 There is no relationship between organisational culture and employee motivation.

H_3 There is a relationship between organisational culture and employee motivation.

Hypothesis 4

H_0^4 There is no relationship between management and organisational culture.

H_4 There is a relationship between management and organisational culture.

Hypothesis 5

H_0^5 There is no relationship between employee performance and innovation.

H_0^5 There is a relationship between employee performance and innovation

Hypothesis 6

H_0^6 There is no relationship between organisational efficiency and innovation.

H_6 There is a relationship between organisational efficiency and innovation.

Hypothesis 7

H_0^7 There is no relationship between organisational efficiency and standards.

H_7 There is a relationship between organisational efficiency and standards.

Hypothesis 8

H_0^8 There is no relationship between standardisation effort and standards.

H_8 There is a relationship between standardisation effort and standards.

SEM was used to determine possible significant associations between the key study constructs (Schumacker & Lomax, 2004) and also to test the hypotheses.

First, correlation analysis was conducted to determine the degree and direction of the relationship (positive or negative) between the constructs, and finally SEM was conducted to determine the causal relationships. AMOS 23.0, which is part of the SPSS 23.0 statistical package, was employed to analyse the data. AMOS is a statistical tool, which implements the approach to data analysis known as SEM, also known as analysis of covariance (see Hair et al., 1995), or causal modelling (see Field, 2005). The maximum likelihood method (see Hair et al., 1995) was used. AMOS is an easy-to-use program for visual SEM and the user can quickly specify, view and modify the model graphically using simple drawing tools.

5.11.1 Correlations

Table 5.22 indicates strong correlation of the different constructs with leadership and management (0.927). It is important for leadership and management to foster a good relationship and open discussions when an IMS is required as this will improve efficiency in the organisation. Motivation and culture showed a very weak relationship (0.071) indicating that the culture of the organisation was not related to motivation. This is interesting as the literature indicates that a positive organisational culture will result in motivated staff (see Eustace & Martins, 2014; Denison and Spreitzer, 1991). Furthermore, a correlation between standardisation effort and policy (-0.728) was evident. This correlation was significant as it showed that standardisation effort affects standards negatively. This will not improve the efficiency of the organisation. Literature (see Anupindi et al., 2006) indicates that standardisation effort and standards are positively correlated and the amount of effort expended should see a proportional increase in organisational efficiency. This can be a potential discussion for future research activities in this field.

Table 5.22: Correlation analysis

			Estimate
Culture	<-->	Management	0.673
Motivation	<-->	Management	0.370
Motivation	<-->	Leadership	0.433
Motivation	<-->	Culture	0.071
Leadership	<-->	Management	0.927
Leadership	<-->	Culture	0.713
Performance	<-->	Standardisation effort	0.177
Standards	<-->	Standardisation effort	-0.728
Policy	<-->	Standardisation effort	0.135
Policy	<-->	Standards	0.422
Policy	<-->	Performance	0.598
Innovation	<-->	Standards	0.267

5.12 SECTION D: ANALYSIS OF THE STRUCTURAL MODEL

One can assess the model's fit, make modifications and print a publication quality graphic of the SEM model (Arbuckle, 2007). The various model fit criteria are summarised in Table 5.23.

Table 5.23: Model fit criteria and acceptable fit interpretation

Model fit criterion	Acceptable level	Obtained value
CMIN/DF (χ^2)	>1 and < 3	2.077
Goodness-of-fit (GFI)	0 (no fit) to 1 (perfect fit)	0.498
Root mean square error of approximation (RMSEA)	< 0.080	0.070
Normed fit index (NFI)	0 (no fit) to 1 (perfect fit)	0.998
Incremental fit index (IFI)	0 (no fit) to 1 (perfect fit)	0.999
PCLOSE	0 (no fit) to 1 (perfect fit)	0.261
HI 90	0 (no fit) to 1 (perfect fit)	0.149
CFI	0 (no fit) to 1 (perfect fit)	0.999
PCFI	0 (no fit) to 1 (perfect fit)	0.067

Notes: **PCLOSE** = test of close fit; **HI** 90 = test of fit indice; **CFI** = comparative fit index; **PCFI** = parsimonious comparative fit indice

Various model fit criteria showed a good model fit to data from Table 5.21 with the hypothesised model. Some common fit indices reported in SEM were designed to identify

model goodness-of-fit. In this research, seven common measures of model fit were chosen to be used, namely chi-square/degrees-of-freedom (χ2/df), goodness-of-fit index (GFI), comparative fit index (CFI), normed fit index (NFI), and root mean square error of approximation (RMSEA). Thus, this research followed these recommendations when comparing the fitted model.

The results of the SEM obtained for the proposed conceptual model revealed a ratio of chi-square value to the degree of freedom (χ2/df) of 2.070, a GFI of 0.498, CFI of 0.999, NFI of 0.998, IFI 0.999 and RMSEA of 0.070. Generally, fit statistics greater than or equal to 0.9 for GFI, NFI, RFI and CFI indicate a good model fit (Hair et al., 1995). Furthermore, RMSEA values ranging from 0.05 to 0.08 are acceptable (Hair et al., 1995); therefore, the RMSEA suggested that the model fit was acceptable. Furthermore, other derived fit statistics indicate a satisfactory fit.

5.13.1 Hypothesis testing

Hypothesis testing was conducted in order to answer the investigative question derived from the research question. The research question to be answered was:

What would be a suitable framework that could be used to integrate management systems in a structured manner towards improving efficiency in an organisation?

This section reports on the testing the eight hypotheses postulated in setion 3.15 using the Pearson correlation (see Hair et al., 1995) and SEM, which indicates the extent to which variables were related. The values of *r* ranges from -1 to +1. The closer the value of *r* is to +1, the stronger the positive correlation between the 2 variables. The closer the value of *r* is to -1, the stronger the negative correlation between the two variables in question. Generally, for any values where $0 < |r| < 0.3$, this represents a weak correlation between the variables (Bryman, 2012). For any values $0.3 < |r| < 0.7$, this represents a moderate correlation (Bryman, 2012). For any values where $|r| > 0.7$, this represents a strong correlation between the variables.

Table 5.24 shows the regression weights or estimated coefficients obtained in SEM. The table displays the unstandardised estimates of coefficients, their standard errors (SE) and the estimate divided by the critical ratio (abbreviated CR for critical ratio). The probability values associated with the null hypothesis that the coefficients are equal to zero are displayed under the probability (P) column.

Table 5.24: Regression weights

			Estimate	SE	CR	P
Culture	<---	Management	0.561	0.040	14.067	***
Motivation	<---	Culture	0.819	0.012	70.917	***
Efficiency	<---	Management	1.181	0.452	2.616	0.009
Efficiency	<---	Leadership	1.000			
Efficiency	<---	Motivation	0.040	0.140	0.287	0.774
Efficiency	<---	Culture	0.626	0.281	2.229	0.026
Standardisation effort	<---	Management	0.269	0.131	2.048	0.041
Standardisation effort	<---	Motivation	0.273	0.072	3.798	***
Standardisation effort	<---	Culture	0.065	0.062	1.052	0.293
Standardisation effort	<---	Efficiency	0.109	0.064	1.697	0.090
Standards	<---	Motivation	-0.329	0.084	-3.912	***
Standards	<---	Effort	1.000			
Standards	<---	Efficiency	0.136	0.044	3.104	0.002
Policy	<---	Culture	0.062	0.151	0.411	0.681
Policy	<---	Efficiency	0.638	0.105	6.070	***
Policy	<---	Management	0.197	0.213	0.927	0.354
Policy	<---	Standards	-1.100	0.098	-11.272	***
Performance	<---	Culture	0.247	0.181	1.369	0.171
Performance	<---	Efficiency	0.542	0.444	1.220	0.223
Performance	<---	Policy	-0.781	1.106	-0.706	0.480
Innovation	<---	Motivation	0.019	0.136	0.139	0.889
Innovation	<---	Leadership	-0.386	0.274	-1.407	0.160
Innovation	<---	Performance	1.000			
Innovation	<---	Efficiency	1.000			
Innovation	<---	Standards	-2.579	0.809	-3.187	0.001

From Table 5.23 above, it can be deduced that, the latent variable ‘efficiency’ is influenced by three factors, namely, management (B = 1.181, prob. = 0.009 < .01), leadership (B = 1.000) and culture (B = 0.626, prob. = 0.026 < 0.050). To make the model identifiable, the regression weight of leadership was constrained to 1. All three variables – leadership, management and organisational culture – influence efficiency positively. Management influences the IMS and drives efficiency in an organisation (Huy (2011). From the table, it is clear that efficiency (B = 0.542, prob. = 0.223 > 0.100) does not influence employee performance of management systems. Efficiency affects standardisation effort (B = 0.109, prob. = 0.090<0.100), standards (B = 0.136, prob. = 0.002 < 0.010), policy (B = 0.638, prob. = <0.000 < 0.010), and innovation (B = 1.000). This implies that leadership, management and organisational culture affect these variables indirectly. Innovation is highly positively affected by performance (B = 1.000) and efficiency (B = 1.000), and negatively by standards (B = -2.579, prob. = 0.001 < 0.010).

Management also affects organisational culture (B = 0.561, prob. = 0.000 < 0.010) and standardisation effort (B = 0.269, prob. = 0.041<0.050) directly and positively.

Management has a direct effect on the organisation as they are in contact with the employees and are directly involved with the integration of management systems. So if they have adopted an organisational culture that aligns with the organisation, the employees will likewise adopt this culture, which will improve the IMS.

Standards that are set will be to meet organisational objectives and the policy of the organisation will be implemented consistently in each department. Apart from organisational culture affecting employees' performance of management systems through efficiency, it also directly affects motivation (B = 0.819, prob. = 0.000 < 0.010) positively. Hence, the nature of organisational culture motivates employees of an organisation to achieve targets. If the organisational culture is driven by management, then organisational culture drives efficiency in the integration of management systems. Employee motivation affects standardisation effort (B =0.273, prob. = 0.000 < 0.010) positively and standards (B = -0.329, prob. = 0.000 < 0.010) negatively. Employee motivation does not affect innovation (B = 0.019, prob. = 0.889 > 0.100). When employees in an organisation are motivated, the amount of effort they expend in the execution of their jobs will improve their effort (B = 1) resulting in better performance and efficiency when integrating management systems. They will thereby become innovative to strive for results and as a result drive efficiency. Standards strongly affect policy (-1.100, prob. = 0.000 < 0.010) negatively. From the literature (see Garcés-Mascareñas & Penninx, 2016; Huddleston & Tjaden, 2012). it is debated that standards are highly correlated to policy. This still needs to be investigated and can be undertaken as future research.

5.13.2 Path analysis

This section describes an assessment of the causal effects amongst the variables tested. Figure 5.6 refers to the structural equation model showing the measurement and structural components involved with integrating management systems. The SEM figure below provides the inter-relationships of factors for the IMS process. It is interesting to note in the figure that three constructs (i.e. leadership, management and organisational culture), which form the efficiency latent variable, management (1.181) has the heaviest regression weight and then leadership (1.000). This supports the theory that management and leadership are key instruments in influencing the IMS and improving efficiency.

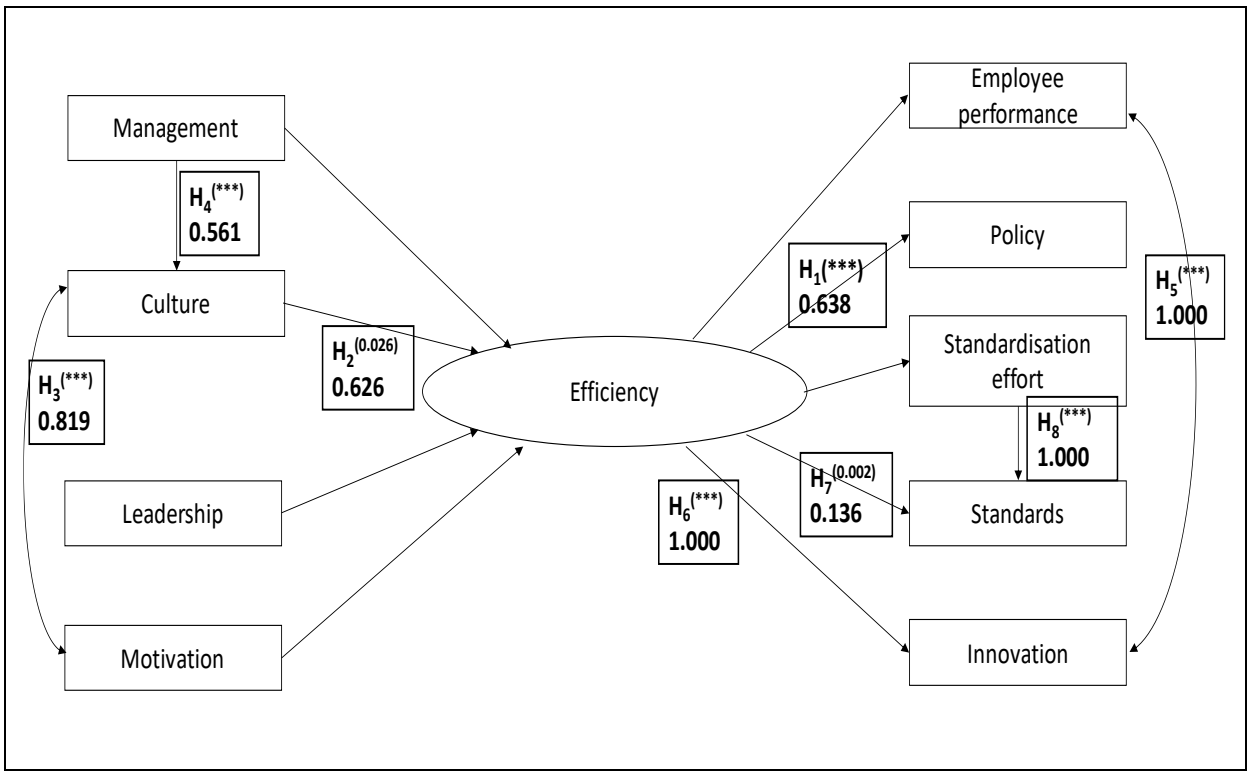

Figure 5.6: SEM for IMS

In conclusion, the original hypothesised model (see figure 3.4) should contain all of the postulated constructs. The model Figure 5.6 indicates that the integration of the management systems is not only affected by efficiency, which is influenced by leadership, management and organisational culture but also by employee motivation (which is influenced by organisational culture). In order to integrate management systems, an organisation therefore needs to be efficient (influenced by leadership, management and organisational culture) and motivated staff. With these in place, performance will increase, innovation, effort and standards will be kept and policy implementation undertaken effectively.

These findings imply that the Pearson chi-square test results were set at the 95% level of confidence. The decision rule is that results with p-value < 0.05 will be rejected.

5.13.2.1 Hypothesis 1

The purpose of hypothesis 1 was to answer the investigative question whether there is a relationship between organisational efficiency and policy.

H_0^1 There is no relationship between organisational efficiency and policy.

H_1 There is a relationship between organisational efficiency and policy.

The null hypothesis was that the relationship between organisational efficiency and policy is zero. The alternative was that there is a relationship between organisational efficiency and policy. Table 2.25 shows that the probability of the critical ratio (CR) for the relationship between organisational efficiency and policy was less than 0.010. This represents a significant relationship between the two variables at the 99% level of confidence.

Table 5.25: Hypothesis 1 – relationship

Variable	Mean	SD		**Organisational efficiency**
Policy	5.300	1.900		
			Probability of CR	< 0.010

Based on the above table of the SEM results for the relationship between organisational efficiency and policy, the decision rule was to reject the null hypothesis and accept the alternative.

H_0^1	There is no relationship between organisational efficiency and policy.	Rejected
H_1	There is a relationship between organisational efficiency and policy.	Accepted

From the results, it is clear that there was sufficient evidence that there is a significant relationship between organisational efficiency and policy. This confirms that, because the relationship is positive an organisation could improve its efficiency by implementing an IMS policy.

5.13.2.2 Hypothesis 2

The purpose of hypothesis 2 was to answer the investigative question whether there is a relationship between organisational culture and organisational efficiency.

H_0^2 There is no relationship between organisational culture and organisational efficiency.

H_2 There is a relationship between organisational culture and organisational efficiency.

The null hypothesis was that the relationship between organisational culture and organisational efficiency is zero. The alternative was that there is a relationship between organisational culture and organisational efficiency. Table 5.26 shows that the CR probability for the relationship between organisational efficiency and policy was 0.026, which is < 0.050, the level of significance. This represents a significant correlation at the 95% level of confidence between the two variables.

Table 5.26: Hypothesis 2 – relationship

Variable	Mean	SD	**Organisational culture**
Organisational efficiency	5.300	1.800	
		Probability of CR	0.026

Based on the above table of the SEM results for the relationship between organisational culture and organisational efficiency, the decision rule was to reject the null hypothesis and accept the alternative hypothesis.

H_0^2	There is no relationship between organisational culture and organisational efficiency	Rejected
H_2	There is a relationship between organisational culture and organisational efficiency	Accepted

From the results, it is clear that there was sufficient evidence that there is a significant relationship between organisational culture and organisational efficiency. This confirms that, because the relationship is positive, an organisation, which implements an IMS, could improve its efficiency when the organisational culture is entrenched.

5.13.2.3 Hypothesis 3

The purpose of hypothesis 3 was to answer the investigative question whether there is a relationship between organisational culture and employee motivation.

H_0^3 There is no relationship between organisational culture and employee motivation.

H_3 There is a relationship between organisational culture and employee motivation.

The null hypothesis was that the relationship between organisational culture and employee motivation is zero. The alternative was that there is a relationship between organisational culture and employee motivation. Table 2.57 shows that the CR probability for the relationship between organisational culture and employee motivation was 0.010 which is < 0.050, the level of significance. This represents a significant relationship at the 95% level of confidence between the two variables.

Table 5.27: Hypothesis 3 – relationship

Variable	Mean	SD	**Organisational culture**
Employee motivation	5.300	1.800	
		Probability of CR	< 0.010

Based on the above table of the SEM results for the relationship between organisational culture and employee motivation, the decision rule was to reject the null hypothesis and accept the alternative hypothesis.

H_0^3	There is no relationship between organisational culture and employee motivation	Rejected
H_3	There is a relationship between organisational culture and employee motivation	Accepted

From the results, it is clear that there was sufficient evidence that there is a significant relationship between organisational culture and employee motivation. This confirms that an organisation, which implements an IMS, could benefit when the organisation culture is aligned to employee performance thereby improving its efficiency. Organisation culture strongly influences employee motivation; therefore, an organisation that implements IMS would benefit when the two factors are aligned.

5.13.2.4 Hypothesis 4

The purpose of hypothesis 4 was to answer the investigative question whether there is a relationship between management and organisational culture.

H_0^4 There is no relationship between management and organisational culture.

H_4 There is a relationship between management and organisational culture.

The null hypothesis was that the relationship between management and organisational culture is zero. The alternative was that there is a relationship between management and organisational culture. Table 5.28 shows that the CR probability for the relationship between management and organisational culture was 0.010, which is < 0.050, the level of significance. This represents a significant relationship at the 95% level of confidence between the two variables.

Table 5.28: Hypothesis 4 – relationship

Variable	Mean	SD		**Management**
Organisational culture	5.300	1.800		
			Probability of CR	< 0.010

Based on the above table of the SEM results for the relationship between management and organisational culture, the decision rule was to reject the null hypothesis and accept the alternative hypothesis.

H_0^4	There is no relationship between management and organisational culture	Rejected
H_4	There is a relationship between management and organisational culture.	Accepted

From the results, it is clear that there was sufficient evidence that there is a significant relationship between management and organisational culture. This confirms that because the relationship is positive, an organisation, which implements an IMS, could benefit when management adopts the organisation culture, which would improve organisational efficiency.

5.13.2.5 Hypothesis 5

The purpose of hypothesis 5 was to answer the investigative question whether there is a relationship between employee performance and innovation.

H_0^5 There is no relationship between employee performance and innovation.

H_0^5 There is a relationship between employee performance and innovation

The null hypothesis was that the relationship between employee performance and innovation is zero. The alternative was that there is a relationship between employee performance and innovation. Table 5.29 shows that the CR probability for the relationship between employee performance and innovation was < 0.010, which is < 0.010, the level of significance. This represents a highly significant relationship at the 99% level of confidence between the two variables.

Table 5.29: Hypothesis 5 – relationship

Variable	Mean	SD		**Employee performance**
Innovation	5.300	1.800		
			Probability of CR	< 0.010

Based on the above table of the SEM results for the relationship between employee performance and innovation, the decision rule was to reject the null hypothesis and accept the alternative hypothesis.

H_0^5	There is no relationship between employee performance and innovation.	Rejected
H_5	There is a relationship between employee performance and innovation.	Accepted

From the results, it is clear that there was sufficient evidence that there is a significant relationship between employee performance and innovation. Because the relationship is positive, this confirms that organisations that manage employee performance when implementing IMS, influence innovation.

5.13.2.6 Hypothesis 6

The purpose of hypothesis 6 was to answer the investigative question whether there is a relationship between organisational efficiency and innovation.

H_0^6 There is no relationship between organisational efficiency and innovation.

H_6 There is a relationship between organisational efficiency and innovation.

The null hypothesis was that the relationship between organisational efficiency and innovation is zero. The alternative was that there is a relationship between organisational efficiency and innovation. Table 5.30 shows the CR probability for the relationship between organisational efficiency and innovation was < 0.010, which is < 0.010, the level of significance. This represents a highly significant relationship at the 99% level of confidence between the two variables.

Table 5.30: Hypothesis 6 – relationship

Variable	Mean	SD	**Efficiency**
Innovation	5.300	1.800	
		Probability of CR	< 0.010

Based on the above table of the SEM results for the relationship between organisational efficiency and innovation, the decision rule was to reject the null hypothesis and accept the alternative hypothesis.

H_0^6	There is no relationship between organisational efficiency and innovation	Rejected
H_6	There is a relationship between organisational efficiency and innovation	Accepted

From the results it is clear that there was sufficient evidence that there is a significant relationship between organisational efficiency and innovation. This confirms that, because the relationship is positive, organisations that manage their innovation activities would improve their organisational efficiency when implementing an IMS.

5.13.2.7 Hypothesis 7

The purpose of hypothesis 7 was to answer the investigative question whether there is a relationship between organisational efficiency and standards.

H_0^7 There is no relationship between organisational efficiency and standards.

H_7 There is a relationship between organisational efficiency and standards.

The null hypothesis was that the relationship between organisational efficiency and standards is zero. The alternative was that there is a relationship between organisational efficiency and standards. Table 5.31 shows that the CR probability for the relationship between organisational efficiency and standards was 0.002, which is < 0.010, the level of significance. This represents a highly significant relationship at the 99% level of confidence between the two variables.

Table 5.31: Hypothesis 7 – relationship

Variable	Mean	SD		**Efficiency**
Standards	5.200	1.800		
			Probability of CR	0.020

Based on the above table of the SEM results and the results between organisational efficiency and standards, the decision rule was to reject the null hypothesis and accept the alternative hypothesis.

H_0^7	There is no relationship between organisational efficiency and standards	Rejected
H_7	There is a relationship between organisational efficiency and standards	Accepted

From the results, it is clear that there was sufficient evidence that there is a significant relationship between organisational efficiency and standards. This confirms that, because the relationship is positive, organisations that set standards will improve their organisational efficiency when implementing an IMS.

5.13.2.8 Hypothesis 8

The purpose of hypothesis 8 was to answer the investigative question whether there is a relationship between standardisation effort and standards.

H_0^8 There is no relationship between standardisation effort and standards.

H_8 There is a relationship between standardisation effort and standards.

The null hypothesis was that the relationship between standardisation effort and standards is zero. The alternative was that there is a relationship between standardisation effort and standards. Table 5.32 shows the CR probability for the relationship between standardisation effort and standards was < 0.010, which is < 0.010, the level of significance. This represents a significant correlation at the 99% level of confidence between the two variables.

Table 5.32: Hypothesis 8 – relationship

Variable	Mean	SD		**Standardisation effort**
Standards	5.000	1.800		
			Probability of CR	<0.010

Based on the above table of the SEM results and the results between standardisation effort and standards, the decision rule was to reject the null hypothesis and accept the alternative hypothesis.

H_0^8	There is no relationship between standardisation effort and standards	Rejected
H_8	There is a relationship between standardisation effort and standards	Accepted

From the results, it is clear that there was sufficient evidence that there is a significant relationship between standardisation effort and standards. This confirms that, since the relationship is positive, organisations that expend time and effort in standards would improve their organisational efficiency when implementing an IMS. This leads to the presentation of the developed framework.

5.14 THE DEVELOPED FRAMEWORK

From the empirical analysis of the data, 10 factors were confirmed as important constructs for the framework. These factors are discussed in Table 5.33.

Table 5.33: Discussion of empirical factors

Significant research factors	**Discussion of items**
1. Leadership	Leadership is involved with the strategic decisions of the organisation and are accountable for the success of IMS. By exhibiting responsible and ethical behaviour this will encourage an organisational culture of high performance. Also leadership must be transparent to all stakeholders in the organisation. This will enable IMS efficiency in the organisation.
2. Management	Management is the interface between leadership and operations and must ensure that an effective organisational culture is enabled through sound motivation techniques, such key performance indicators. An IMS cannot function without management enabling processes. This will drive employees to improve efficiency and obtain the desired performance in an organisation.
3. Organisational culture	The opinion of the participants indicated that they believed that organisations should ensure that norms, beliefs and values are entrenched through management. This is also evident in the literature. Organisational culture is part of the leadership responsibility and distilled through the organisation.
4. Employee motivation	Employee motivation has a significant bearing on organisational performance. Therefore, employee empowerment, work design and incentive structures are essential to the efficient and successful functioning of management systems.

Significant research factors	Discussion of items
5. Efficiency	Organisational efficiency was the underlying variable in the research, and was known as the latent variable (see 5.11.2). The factor 'efficiency' should be driven by upper management as most participants identified efficiency as the determining factor when sustainable performance of an organisation is concerned.
6. Employee performance	The employee performance factor is critical for organisational success. Employee performance must be driven through formalised processes to ensure the organisation achieves its objectives.
7. Standards	In this research, the development of standards was seen as a strong dependent factor. Standardising organisational processes was seen as an instigator to improved efficiency levels in terms of IMS (see 3.7). An IMS will improve efficiency when standards are in place.
8. Innovation	The dependent variable 'innovation' is a factor that will enable organisations to improve efficiency and sustained performance. Management has an important role to play in ensuring that innovation platforms are enabled and sustained in organisations. With innovation platforms in place, an IMS will ensure organisational efficiency.
9. Policy	Organisations that have policies should ensure that management and leadership implement them in a structured and unified manner. Communication must be efficient to ensure sustainable performance is achieved. The policy can also be defined as an important precondition for further modernisation and more intensive and active integration of management systems in organisations.
10. Standardisation effort	The standardisation effort to fulfil the needs of various stakeholders through the execution of business operations is often facilitated by management sub-systems that provide a systematic way to regulate the behaviour of the system so that it consistently behaves in the desired manner. The effort expended by leadership and management must ensure that, when integrating management systems, it is undertaken to fulfil the needs of the various stakeholders (internal and external).

SEM informed the final framework for the study. The Figure 5.7 presents, a framework for the integration of management systems.

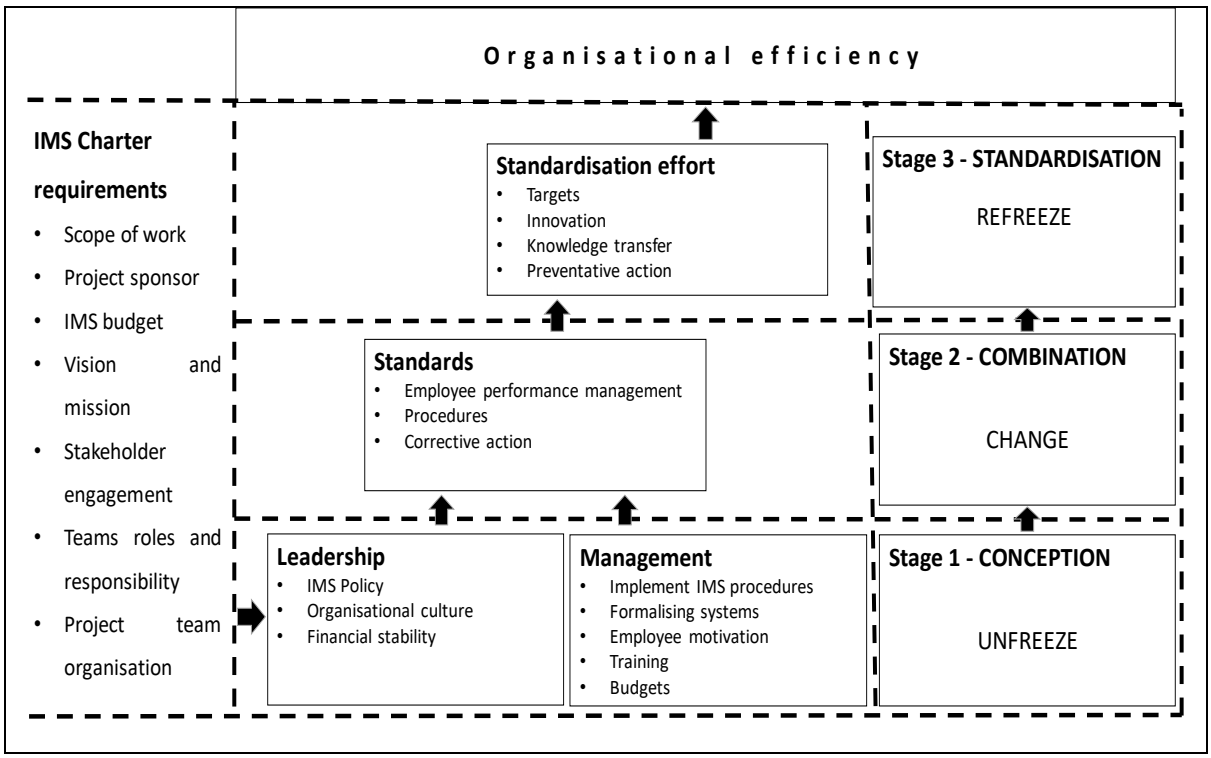

Figure 5.7: A framework for the integration of management systems in organisations

5.14.1 Understanding the IMS framework

To explain the framework and its operability a detailed explanation is presented. This will assist organisations in its implementation. The developed framework is drawn comparatively from the theory of Kurt Lewin's three-step process of change management (see Lewin, 1951). It takes into cognisance of the change management process as a means to implement IMS. The three stages are;

- stage 1 (unfreeze);
- stage 2 (change); and
- stage 3 (refreeze).

5.14.1.1 Requirements: IMS charter

The current research drew upon the IMS process as a three-stage process to improve efficiency in an organisation (Zeng et al., 2007). The IMS charter (see Griffith & Bhutto 2009) forms the initial part of the IMS process. Because IMS is a complex process of implementation (see 2.2), therefore stakeholder management is critical.

Several integration methodologies are suggested in the literature (see Anderson, 1971; Blau, 1960). According to the literature, there is no unique model for all organisations (Bernardo et

al., 2009). Additionally, before introducing the IMS process, the organisational background must be prepared, ensuring that it has appropriate processes, technology and human resources to face new changes and strategies (Hypolito & Pamplona, 1999). This requirement is addressed through the IMS charter, which describes the project vision and objectives (the reasons for embarking on the IMS journey) (Dordević et al., 2010). It also summarises at a high level the overall project strategy, scope, organisation and implementation (Castro & Martins, 2010). The charter also helps to set the direction for IMS and gain confidence from key stakeholders about how the project will be organised and implemented (Freeman & Reed, 1983). The charter also helps control the scope of the project, by defining exactly what it is that the organisation wants to achieve. Ideally, the IMS charter is provided to the project manager by the project sponsor and helps set the direction for the project and gain support from key stakeholders to show how the project will be managed (Freeman & Reed, 1983). If the IMS charter is missing or inadequate, the project manager should develop or augment the document and have the document agreed on and signed by the sponsor or project initiator before starting any other planning process (Maryska & Sladek, 2017).

The key purpose of an IMS charter is to define exactly what the project has to achieve to be successful (Sousa & Guimaraes, 2017). This encompasses:

- Identifying the project vision: the vision encapsulates the purpose of the project and is focused on the business or on benefits.
- Identifying the strategic purpose and alignment of the project.
- Identifying the project objectives: it defines three to five specific objectives that need to be achieved by the project to fulfil the vision. Each objective should be specific, measurable, achievable, realistic and time-bound (SMART) and output-focused (major deliverables).
- Defining the overall project scope: the scope defines the formal boundaries of the project by describing what will be done by the project and what will not be done by the project. What will be done should be described as specific deliverables.
- Defining any staging, phasing and/or gateway requirements: the extent of the current authorisation and how the work will be authorised.

Furthermore, the project is for a new management system, and its vision is to improve efficiency (Chen, 2016). One objective is to provide training. The specific deliverables associated with this objective could include:

- developing the courseware;
- delivering two initial courses and an update of the training materials;

- presenting a ‘train the trainer’ workshop; and
- ongoing support to the business trainer for 6 months.

What is not done by the project is the ongoing training of business staff for the next two or three years. The IMS charter should also outline at a high level how the IMS project work will be accomplished (Bernardo et al., 2012). This includes describing the IMS project organisation and how the project will be structured, including customers, stakeholders, key management roles, responsibilities and reporting lines.

- A **customer** is a person or entity who is responsible for accepting the deliverables when the project is complete.
- **Stakeholders** are people or groups who will be affected by or who can influence the success or failure of the project.
- **Additional roles and responsibilities** include the project sponsor, project board, project manager and other key project positions, each with a summary of their primary roles and responsibilities.
- **Reporting lines**: from the roles and responsibilities, the reporting lines between those roles can be defined in a project organisation chart.
- **Describing the project strategy**: this describes how the project will be executed and forms the framework for detailed project planning. Some aspects to consider are:
  - suitable project software, which could help with the project planning and assessment of milestones;
  - key milestones to be achieved by the project. A milestone is typically an important project event, such as the achievement of a key deliverable;
  - key phases and/or activities, and the overall time frames involved in undertaking the project;
  - any environmental implications, such as opportunities for recycling or waste reduction that should be considered during the planning and implementation of the project;
  - key external dependencies and their criticality to the project. An external dependency is an activity or event that is likely to affect the project during its life cycle;
  - A summary resource plan (based on the methodology and time frame) including the overall requirements for labour, equipment, materials and financial resources; and
  - known major risks and issues: the project charter should identify any significant, known risks, issues, assumptions and constraints related to the project (these have

usually been defined in the business case and need to proceed into the project risk register). Where significant documents exist (e.g. the business case or a statement of work), these documents are referenced in the project charter.

5.14.1.2 Maintaining the IMS charter

At the start of each phase of the project, one of the important actions in initiating the phase is to review the IMS charter and ensure the project as it is defined and understood and that it is still achieving the objectives defined in the charter. If there are discrepancies, the changes need to be processed through the overall change control mechanisms either to update the charter or to re-focus the project on achieving its authorised objectives.

Once the IMS charter has been defined and agreed on by all stakeholders, the first stage of the IMS process can proceed.

5.12.1.2.1 A description of stage 1 (unfreeze): conception

During this stage, leadership and management have a critical role to play in ensuring the IMS is undertaken in a structured manner. IMS is seen as a strategic decision taken at the highest level of the organisation (leadership). Leadership which was empirically tested against efficiency and shown to have a significant and positive relationship to efficiency.

- **Leadership**

The recognition of the interdependence of the constituent parts of a defined system inherently requires that an increased number of internal and external forces and factors be considered in making decisions by leadership (Roberts and Handline, 1975). The type of leadership style will influence the IMS outcome, as demonstrated by Nelson Mandela, who had a transactional style (see Du Toit et al., 2010). This type of leadership will allow communication to employees and from employees (top-down and bottom-up approach). Furthermore, a formal policy on IMS is important to ensure consistency of objectives (Garcés-Mascareñas & Penninx, 2016). The following can be issued as a guideline. The shift in focus from government to governance, from policy to policymaking, allows the organisation to conclude that what matters is not only policy frames and policy measures (i.e. policies as written) but also how these policies are organised and implemented by the different actors involved, i.e. policies in practice (Garcés-Mascareñas & Penninx, 2016). Leadership must enable an organisational culture, which is an essential element required to unify various organisation departments (Ansoff, 1965). Instituting an effective organisational culture is an important approach to advance efficiency in the

organisation (Idris et al., 2015). The following can be utilised as guidelines and organisational factors which shape culture:

- a learning organisation and a culture of responsibility are encouraged. It is important to have a learning process to ensure better design and redesign of systems and thus ensure continuous adaptation to new challenges (Horn & Wilburn, 2005; Patience, 2008)
- the use of information for development of the organisation, allocating accountability and responsibility, and motivation for teamwork and collaboration, opportunities for learning and involvement, fostering a climate of fairness; and
- providing compensation based on equality.

- **Management**

Managers cannot be effective leaders if their employees do not see them as trustworthy. The five dimensions of trust are the following (Du Toit et al., 2010):

- integrity – a manager's honesty and trustfulness;
- competence – a manager's technical and interpersonal knowledge and skill;
- consistency – a manager's reliability, predictability and good judgement in handling situations;
- loyalty – a manager's willingness to protect another person; and
- openness – one can rely on a manger to tell the whole truth.

Although managers engage in decision-making processes at different levels, their decision-making roles are related to non-structural decisions, whose characteristics are unpredictability, existence of plenty of solutions and potential responses, vagueness of the approach to gain correct responses, effect of its results on organisation's goals, being sensitive to environmental and dynamic conditions of the environment, and great dependence on data from the external environment which force a manager to get use of information (IMS procedures) about events of the external environment (Bahmani & Farhadpoor, 2017). Information gained from the external and internal sources of an organisation is processed and fed into the decision-making cycle by individuals and information system of an organisation (Sarrafizadeh, 2011). Management must ensure that they engage with leadership, consider staff morale and motivation, share knowledge amongst employees and formalise systems (IMS procedures) for an operational IMS.

IMS implementation can be facilitated through motivation enablers such as (see Idris, 2015):

- securing management's full support;
- addressing IMS in strategic planning;
- allocating and prioritising resources;
- establishing goals, targets and milestones for IMS;
- involvement of end-users in the design and implementation phase;
- support of IMS experts;
- fostering a culture of teamwork; and
- performance of employees.

This will ultimately enable efficiency in the organisation. If the employer or manager wishes to have an efficient and effective organisation, he or she must set to work to improve employee performance. Therefore, when an IMS is implemented, employee motivation is another factor that will drive the organisation to ensure organisational efficiency.

Finally, this stage includes leadership and management who must demonstrate a high performance culture by driving for results and setting the norms, beliefs and values for the organisation. Additionally, policy and employee motivation are critical parts of the IMS and the framework that leadership and management must establish. Not only does it provide substance, guidance and clear objectives, the framework also allows for the introduction of the required performance levels that all stakeholders must achieve in order to achieve IMS efficiency (Morton, 1991). All stakeholders will understand the deliverables from implementing IMS and thereby improve the organisational efficiency. Leadership is accountable to its shareholders to ensure that the organisation is financially sustainable. With the aforementioned in place, this will enable IMS in the organisation.

5.14.1.2.2 Description of stage 2 (change): combination

This stage validates that the commitment from management that they want to pursue an IMS and have ensured the necessary variables (sub-factors) in stage 1 have been communicated and implemented in the organisation. At this stage, it is considered that an IMS policy, organisational culture and commitment from top management are embedded in the organisation. Setting standards (procedure, roles and processes) is important for enabling stage 2. Here, management must deliver standardised methods for IMS to be implemented successfully. Standards and efficiency are positively and highly significant factors (Egyedi & Sherif, 2010). This implies that in order for an organisation to flourish (improve efficiency), agreement of processes with employees must be undertaken and must be documented. Ensure do what is documented not only document what to do. Furthermore, these procedures

must be geared towards organisational agility and improving competitiveness in the market where it operates.

- **Standards**

Standards are aimed at the achievement of order (Foray, 1998). It is critical that this factor ensures that the rules and guidelines for the implementation of IMS be implemented. Standards define the processes that must be followed to achieve the goals ultimately to improve the efficiency of the organisation. Setting rules, guidelines or procedures will therefore streamline the IMS implementation process. This will also entail combining different procedures and standards that were once deemed unintegratable to reach a cohesive standard. Employees play an important part in the IMS process and their performance must be integrated into the standardised activities.

A shared understanding of internal and external challenges involves organisational culture, learning and active participation of employees (Jorgensen et al., 2006). Employees are considered with both intrinsic and extrinsic factors (Herzberg, 1966).

- Management must ensure that employee performance is measured through formalised systems, for example KPAs.
- There must also be a strong focus on organisational teamwork and collective collaboration amongst employees (skills transfer and job rotation) and efficiency within their departments.
- Job control must be identified through visible goals together with organisational learning (OL) and is a valuable approach to understand the IMS (Argyris & Schoen, 1978; Huber, 2011). OL occurs when an organisation acquires or creates knowledge, develops new ways of thinking, and modifies its behaviour to reflect new knowledge and insights.
- OL contains two broad types of learning processes: one aimed at doing a better job of matching outcomes of organisational actions with intentions (e.g. by correcting ineffective activities – single-loop learning, and the other aimed at improving the knowledge of an organisation (e.g. by questioning and updating norms, practices, and underlying assumptions and beliefs hitherto accepted in the organisation – double-loop learning.

Employee performance is attributed to cognitive mechanisms, namely increased communication, better utilisation of knowledge and increased understanding of objectives. Therefore, employee management must be aggregated to align to the IMS charter to ensure

that all stakeholders are accountable for their deliverables of the organisation. The alternative is that, when processes fail to meet their intended goals and deliverables, corrective action must also be instituted to ensure the process is back to normality. Finally, standards have the following key common elements: rules, guidelines or characteristics for activities (Burita & Zeman, 2017). Employee performance processes as part of the standards stage should be implemented to ensure efficacy of the organisation.

5.14.1.2.3 Description of stage 3 (refreeze): standardisation

During this stage, the organisation has to acknowledge the benefits and influence of the IMS process. All stakeholders are involved, and the IMS is communicated (transparency) throughout the organisation.

- **Standardisation effort**

At this stage, the standardisation effort is geared toward knowledge transfer, skills development and training, which are undertaken continuously. The IMS charter has made significant progress and roles are now fully functional. Employees understand their responsibility towards the IMS and the benefits are being realised. This will enable continuous learning and development of employees. Also employees should understand the IMS process and its contribution to the overall organisational objectives and efficiency.

Organisations must encourage employees to develop and improve their skills sets continuously, through innovative work designs and training needs analysis (De Oliveira Matias & Coelho, 2010). Interaction with stakeholders in identifying types of platforms for innovation and follow-through of ideas, will promulgate effective IMS. This can be carried out through:

- cooperation, dialogue and transparency when IMS is initiated; and
- platforms for incremental innovation are available for the organisation.

Organisations or those with complicated processes cannot function well without a management system (Almeida, 2014). The more developed the organisation and the more people involved in its activities, the greater the need for written procedures, instructions, forms and records for the organisation to be able to achieve their objectives. A continuous innovation strategy will ensure both creating both innovation and having continuous improvement based on business performance perspectives (Chen, 2016). It is important to do this in order to improve on the efficiency of the organisation. Prior conditions such as developing the IMS charter, are a necessary step before an organisation embarks on the IMS process. Process management deals with timely detection and rectification of quality problems in the production

process (Sousa & Guimaraes, 2017). Process management employs preventive and proactive techniques for IMS. This will lead to a level of IMS that common system elements and generic processes do not attain successfully.

5.15 CHAPTER SUMMARY

This chapter presented the sequential mixed-methods approach. Both the qualitative and quantitative approaches were discussed. The qualitative phase confirmed the factors for the conceptual framework. During the quantitative phase, the data, which was obtained from 220 participants in the ICT sector by means of the online web-based survey, was analysed. A series of hypotheses were postulated and tested after which path analysis was employed (see 5.11.2) to generate a framework intended to predict the enablers for an IMS.

In the next chapter, the results from this chapter as implemented to present the conclusion and recommendations for this study are presented.

CHAPTER 6

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter presents the conclusions for the research study, discussing the findings, and making recommendations for future research based on the objectives that were set at the beginning of the research. These are discussed in the relevant subsections of this chapter.

The research concentrated on the following research question: what would be a suitable framework that could be used to integrate management systems in a structured manner towards improving efficiency in an organisation? This was operationalised to identify the factors for an IMS in the light of an extensive literature review. These factors were validated and expanded by conducting interviews with various stakeholders. After validating the factors, a working conceptual framework was formulated (see 3.15) and a questionnaire was developed (see Annexure D) to seek clarity on the acceptability of these factors. A total of 220 respondents formed the sample to conduct structural equation modelling.

6.2 SUMMARY OF THE FINDINGS

A brief discussion of selected theory is presented by comparing empirical values with the theoretical findings.

6.2.1 Leadership

Leadership was empirically tested as a factor of an IMS, and shown to positively and significantly be associated with IMS efficiency (see 2.10). The regression weight was 1.000 with a probability value of the critical ratio (CR) of less than 0.010 (<. 01).

Leaders have a key role in strategy formulation and implementation (Bourne, 2008). In order to achieve this, leaders must be actively and visibly engaged in the organisation, displaying transformational leadership (leaders effect on followers in that the followers feel trust, loyalty and admiration for their leaders and are motivated to do more than is expected of them). To be an effective top leadership team, members must share common beliefs and aspirations about the organisation and its future direction (Vargo & Seville, 2011).

The recognition of the interdependence of the constituent parts of a defined system inherently requires that an increased number of internal and external forces and factors be considered in making decisions by leadership (Roberts and Handline, 1975). Prominent among these factors is the organisational environment when making decisions and engaging with employees. The research does not endorse a specific leadership style when integration of management systems is undertaken; however, it does recommend that organisational culture should be considered. Summarising the contributions of the leadership theories explained (see 2.10), at any given time, the leadership of an organisation will have many decisions to make – decisions that are work-oriented, people-oriented, and environment-oriented, which pertain to the short run and to the long run, and which reflect movement toward precise objectives and a heuristic reach for improvement. Also, as far as an IMS is concerned, which is a complex process and would require support, commitment and responsibility to ensure that management systems are integrated in a structured manner, leadership must guide, mentor and hold employees accountable for their actions.

6.2.2 Management

Management was empirically tested as a factor of an IMS and shown to be positively and significantly associated with IMS efficiency (see 2.11.4). The regression weight was 1.181 and the probability of the CR was 0.009 (< 0.01).

Fayol (1949) delineated the elements of organisational administration into planning, organising, command, coordination and control. He also developed 14 general principles of management, namely unity of command, unity of direction, discipline, division of work, authority and responsibility, remuneration, centralisation, scalar chain, order, equity, stability of tenure and personnel, subordinate of individual to general interest, initiative, and *esprit de corps*. While often applied in different ways, these 14 principles of management are still respected as legitimate principles. Scientific management is based on scientific decision-making and logical thinking. Taylor's principles (see 3.4) were used to increase worker productivity which greatly affected the US manufacturing industry (Roth, Schweiger and Morrison, 1991). Taylor's approached as described by Bobrek and Sovoric (2006) involves choosing adequate techniques from a wide portfolio, which could contribute to different goals of management and affirmation of synergetic effects on all kinds of organisation. Managers will normally use a wide range of tools for these processes but these tools need to be applied competently to produce positive effects.

Therefore, a scientific management approach for every concrete management system means application of different methods and tools, which in concrete conditions, results in best effects.

Noble (2000) studied the experiences of two case organisations, which used the scientific management approach, and both had exceptional results but it also showed that the benefits will be delivered only if management design systems in which it can work. This approach therefore capitalises on a culture of learning as the approach must be modified before application in each organisation. Thus, this approach could very well be recommended, and could lead to the IMS in an organisation.

6.2.3 Policy

Policy was empirically tested as a factor of an IMS and shown to be positively and significantly associated with IMS efficiency (see 2.4.3.1). The regression weight was 0.638 and the probability of the CR was less than 0.010 (< 0.01).

It was discussed in the literature (see Garcés-Mascareñas & Penninx, 2016) that the effect of policy is translated into local-level practice, which seems to be a crucial question for understanding whether integration programmes achieve their goals. According to Candel and Biesbroek (2016), the role of policy integration in the governance of cross-cutting policy problems has attracted increasing scholarly attention in recent years. Nevertheless, the concept of policy (dis)integration is still under-theorised. In addition, Garcés-Mascareñas and Penninx (2016) found in their research that policy matters, not only policy at the national level but also policy at regional and local level.

Developing a policy provides a platform for improving the integration of employees and management systems into the fabric of the organisation. Policies often posit ideal outcomes, and their vague formulations are not always clear guides for action to those who are to implement them. Reflecting the concerns of state bureaucracies, policies are then instruments in the process of shaping and completing such processes (Handelman, 1976). Eastmond (2011) reports that, according to Bosnians in Rome, they enjoyed a better standard of living when a state policy was implemented regarding immigrants. By contrast, Bosnians in Norway and Sweden said that there was virtually no state policy of integration in place, assistance was limited, and initial years of settlement had been a struggle. In addition, during the qualitative phase, the current research found that most organisations did not have a policy for the IMS in place. This compromised the IMS process and confused employees as there was no structured manner for implementing systems. It is therefore recommended that organisations should embark on a policy for the IMS to ensure that employees identify with the objectives and the required deliverables of the organisation.

6.2.4 Standards

Standards were empirically tested as a factor of an IMS and shown to be positively and significantly associated with IMS efficiency (see 3.7). The regression weight was 0.136 and the probability of the CR was 0.002 (< 0.01).

According to Burita and Zeman (2017), it is evident that one of the rationales for the adoption of standards is that time spent on small decisions results in less time available to tackle bigger decisions (Botzem & Dobusch, 2012). High global competition, intense pressure and increasing demand from different stakeholders lead the organisation to adopt different management systems and standards. Defined standards are designed to provide a clear definition of each business process for simplification of communication within the organisation and organisation communication with its surroundings. Standards may define requirements for the formats used and processing procedures, data structures and data exchange. Defined standards not only enable efficient management of the entire organisation but also planning its future activities (Novotny, 2006). Alignment of standards is important, as this is when the similarities of the standards are used to structure the system. The best way to initiate the integration of MSs is to seek common points in the various standards and to ensure that the greatest possible number of procedures is shared among different MSs, or in other words, attempts should be made to adapt and integrate the maximum number of procedures into the various systems that is, combined management procedures for an IMS.

6.2.5 Organisational culture

Organisational culture was empirically tested as a factor of an IMS and shown to be positively and significantly associated with IMS efficiency (see 2.14). The regression weight was 0.626 and the probability of the CR was 0.026 (< 0.01).

Kotler and Armstrong (2006) state that the cultural environment consists of all the institutions and forces that have an effect on the basic values, perceptions, preferences, and behaviours of the members of a society. Zeng (2011) emphasises that organisational culture refers to the pattern of beliefs, values and learned ways of coping with experience that have developed during the course of an organisational history, and which tend to be manifested in the material arrangements of the organisation and the behaviour of its members. According to Ott (1989), workplace culture refers to the values, beliefs, norms, customs and practices of an organisation. Growth, profitability, productivity and performance improvement are critical factors for the success of any business. Organisational culture involves a culture of learning,

continuous improvement and stakeholder involvement. However, the preconditions for this integration of management systems are:

- a shared understanding of internal and external challenges;
- a learning organisation and a culture of responsibility; and
- interaction with stakeholders.

Therefore, the current research concluded that organisational culture is one of the pillars of an IMS and if properly conducted, it will lead to competitive advantage, continuous improvement and increased sustainable financial performance.

6.2.6 Employee motivation

Employee motivation was empirically tested as a factor of an IMS, and was shown not to be positively associated with IMS efficiency (see 2.13). The regression weight was 0.040 and the probability of the CR, which was not significant, was p = 0.774 (> 0.1). Although the p-value was high, it can still be considered for the IMS framework as it affects standardisation effort positively.

Maslow's (1943) theory of human motivation were arranged in a hierarchy ranging from physiological to safety, social, ego and self-actualisation needs. Herzberg's (1966) contribution to management thinking derives in part from his theory that two sets of variables, hygiene factors and motivators, together influenced worker motivation, and partly from his concept of job enrichment. While Herzberg (1966) did not say that hygiene factors were less important than motivators, as with Maslow's (1970) theory, many managers misinterpreted the theory to say that investments in salary, fringe benefits and working conditions could yield only limited results (Huczynski, 1996). Extrinsic factors include such factors as pay, supervision, working conditions and job security. The extent to which extrinsic factors are absent (or not at an acceptable level) causes job dissatisfaction, but their presence above the acceptable level does not cause job satisfaction (Maslow, 1970). Intrinsic motivation factors include achievement, recognition and responsibility for work (Maslow, 1970). Intrinsic factors cause job satisfaction (Herzberg, 1966). Much case research suggests that human resource (HR) considerations, such as employee empowerment, training, work design and incentive structures, are essential for the efficient and successful functioning of management systems (Boys & Wilcock, 2014).

Employee motivation therefore has a significant bearing on employee performance. As a result, employee empowerment, work design and incentive structures are essential to the

efficient and successful functioning of management systems. Increases in employee motivation and higher collaboration within departments will increase organisational efficiency.

6.2.7 Innovation

Innovation was empirically tested as a factor of an IMS and shown to be positively and significantly associated with IMS efficiency (see 3.7). The regression weight was 1.000 and the probability for the CR was less than 0.010.

Innovation is defined as “the commercialisation of all new combinations based upon the application of new materials and components, the introduction of new processes, the opening of new markets, and/or the introduction of new organisational forms (Schumpeter, 1934). Innovations can take different forms, such as upgrades, extensions and major changes in existing products and processes (Kim et al., 2013).

For successful IMSs, organisations should have knowledge sharing and dissemination processes designed for IMS to succeed. The process of incremental innovation could create conditions for radical improvements (Chen, 2006). To keep improving radical innovation, this requires continuing with follow-up of the improvements. Radical innovation, however, can sometimes only be subject to a significant increase in investment (Chen, 2016). Then it is necessary to integrate capital resources, personnel capacities and conditions suitable for the innovation adequately. Essentially, from the literature which indicated that organisations must embark on processes for incremental innovation first and ensure that platforms for employees to embark on this process. All internal and external stakeholders should be an integral part of the process of innovation.

6.2.8 Standardisation effort

Standardisation effort was empirically tested as a factor of an IMS and shown to be positively associated with IMS efficiency (see 5.8.6). The regression weight was 0.109 and the probability for the C.R was 0.090 (< 0.1). Although the p-value was high, it can still be considered for the IMS framework as it is positively affected by IMS efficiency.

Standardisation is the process of developing and implementing specifications based on the consensus of the views of firms, users, interest groups and governments (Saltzman et al., 2008; Sherif, 2006). For example, Tassey (2000) explains, “standardisation represents a codification of an element of an industry's technology or simply some information relevant to the conduct of economic activity”.

Organisations must use considerable effort to transfer knowledge, skill and when implementing an IMS. This will ensure all employees understand the IMS.

6.2.9 Employee performance

Employee performance was empirically tested as a response variable for an IMS. It was shown not to be associated by IMS efficiency (see 2.12.4). The regression weight was 0.542 and the probability for the CR was 0.223 (> 0.1). Although the p-value was high, it can still be considered for the IMS framework as it affects innovation positively.

The employee performance and employee target factors have been included as discussed in section 2.12. Both factors have a positive effect on the structural equation model and could not be included due to the SEM collapsing on inclusion. It was decided with the statistician and supervisor that it should addressed under the employee performance factor as it formed an integral part of employee performance. From an organisational theory (Morton, 1991) standpoint, organisational leaders need to understand and be able to apply theories relating to –

- the planning and execution of strategic and tactical actions;
- the development, management and improvement of processes;
- the fiscal and financial control of their organisations; and
- key performance indicators (KPIs), which indicate the extent to which their organisations are successful in achieving organisational and process goals.

This alignment is typically achieved through performance management and goals. Managers and their leadership establish goals as part of the performance management process and align the goals throughout the organisation. Alternatively, the organisation cascades goals down to the workforce. In either scenario, it is often the case that employees need specific training to achieve their goals. The performance factor is critical for organisational success. Leadership style can also promote the notion of continuous improvement in performance.

Therefore, organisations that increase integration can realise competitive advantages and improve performance in a variety of economic performance dimensions, such as market brand and risk image.

6.3 RESEARCH OBJECTIVES

This section presents a discussion of how the research objectives were achieved. Each objective is reviewed and the evidence is presented.

6.3.1 Objective 1

To identify a set of factors from the related literature that could be applied to develop the framework

Firstly, outlining the topic is the initial step in the literature review process followed by searching for relevant academic articles, which in the current research was conducted through the relevant database after specifying the key words and terms that would be used. The second step in the literature review was to assess the quality of the articles and then to provide the plan through a process of thematic analysis. Finally, the identification of the useful and related studies was extracted by summarising all studies related to the topic.

Furthermore, a suitable data analysis strategy was adopted in order to identify the themes of the study. The electronic databases of EBSCOhost, ScienceDirect, SABINET and ProQuest were searched. Due to the nature of the research, a time frame for the articles reviewed was not important as the literature review had to contain seminal works, as well. The following key words were selected for searching purposes: integration, combination, standardisation, management systems, Anderson's (1971) theory, Schumpeter's (1942) combination theory, social integration, political and economic integration. The inclusion criteria for the literature review included the following:

Inclusion criteria:

- quantitative, qualitative, mixed methods and systematic reviews;
- studies conducted in business, leadership, entrepreneurship and quality;
- relevance to integration, standardisation and combination; and
- all articles were in English language.

Thereafter, the analyses of the methodological characteristics of the selected studies included countries of origin, purpose, samples, study design, theory framework and instruments used. At the end of the search in the literature, titles were screened for relevance and abstracts were read carefully. All the studies that did not match the inclusion criteria were excluded.

Additionally, there was a mix of qualitative and quantitative studies. Most of the studies were published in journals related to management and business issues. The selected studies were descriptive studies and some of them were correlational studies, and none of the studies were experimental. Included in this methodology was a review of literature that concerned integration, standardisation and combination theory. All studies aimed at several issues, for example, related to significance of social, political and economic integration. Some of the

studies described refugee and immigrant experiences. In the majority of the studies, participants were in organisations. In addition, studies revealed participants with different levels of experience and different levels of education. The selected empirical studies reflected various valid and reliable scales and questionnaires, which measured several issues related to integration, standardisation and combination of management systems.

The factors identified were:

- leadership;
- management;
- organisational culture;
- employee motivation;
- policy;
- innovation;
- standards;
- standardisation effort;
- employee performance; and
- efficiency.

Once, the literature had been established, the conceptual framework was developed. The conceptual framework was the basis of creating propositions relevant to the following three questions.

- What are the antecedents of positive outcomes in an IMS?
- What is the process through which IMS results?
- Which outcomes might an IMS achieve?

The conceptual framework, presented in Figure 3.3, was developed from a extensive review of the literature based on the following theories,

- complexity theory;
- systems theory;
- management theory; and
- shareholder theory.

Furthermore, other theories and seminal works were also considered, such as resource combination theory (see Black & Boal, 1994), classical organisational theory (see Urwick's, 1937), institutional theory (see Scott, 2003), Herzberg's (1966) two-factor theory, Maslow's (1943) theory of human motivation, decision theory (see Roberts & Handline, 1975) and

Anderson's (1971) information theory as contributing to the factors of the conceptual framework, which was presented and discussed in Chapters 2 and 3.

The process of synthesis of the literature focused on capturing the dominant ideas related to the IMS as it existed at the time of this study. The review of literature revealed important ideas generated by several fields of research such as political, social, financial, medical, educational and engineering. The conceptual framework presented in this research (see 3.15) is an attempt to bring together all these ideas into one whole to provide a comprehensive approach to understanding the phenomenon of IMS within organisations. The framework also proposes relationships between the different factors identified from the literature.

Finally, the research considered 5 factors, namely leadership, management, organisational culture, organisational efficiency and employee motivation as the independent variables. Furthermore, another 5 factors namely standards, standardisation effort, policy, innovation, and employee performance were the dependent variables for the conceptual framework.

6.3.2 Objective 2

> To identify an appropriate research methodology to investigate the relationship and validity of these factors

This objective was reached in two phases, i.e. qualitative and quantitative. The first phase (qualitative) confirmed the factors for the conceptual framework. The second phase (quantitative) was validated by confirming the factors and then testing the relationships between the factors statistically. An explanation of the phases is summarised.

Phase 1:

An exploratory sequential mixed method was adopted as the research approach. The intent of the strategy was to develop better measurements with specific samples of populations to see if data from a few individuals (in the qualitative phase) could be generalised to a large sample of a population (in the quantitative phase). This research adopted firstly the qualitative approach and then the quantitative approach. The research intended to measure the intangible, i.e. views and opinions of the cases which are regarded as abstract in nature. The research approach intended to tap into the minds of individuals of management and employees and therefore this approach was considered most effective for this research. This research methodology informed the research that was qualitatively tested and to determine whether there was an alignment of the conceptual model and the literature review with the participants. This was undertaken through extensive semi-structured face-to-face interviews with

participants from diverse sectors of the economy from organisations who satisfied a strict criteria selection process, which comprised:

- the CEO, chief information officer (CIO) or senior manager in their respective fields;
- over 10 years of experiences within the field of integration; and
- experience had to include dealing with local and international organisations regarding IMSs.

This entailed interviewing 14 participants from diverse sectors of the South African economy. The sectors included

- 4 interviews in the fast-moving consumer goods (FMCG) sector;
- 3 interviews in the government sector;
- 6 interviews in the ICT sector; and
- 1 interview in the banking sector.

The participants comprised a CEO, 10 CIOs and three senior managers. The economic sectors that were represented were banking, fast moving consumer goods, government and ICT organisations, who provided information on the conceptual model and also provided rich data that informed the research instrument. Following the interviews, which had to confirm the validity of the conceptual model, was adjusted slightly. It was also evident that participants could align to the conceptual framework presented in Figure 5.7 and they considered it a satisfactory framework that was representative of an IMS.

Phase 2:

The quantitative phase was undertaken with respondents from the identified organisations. Pilot research was undertaken, firstly with academic peers and then industry experts in the field of IMS. Once the questionnaire was returned to the researcher, slight amendments were made and discussed with the study leader. Thereafter, a web-based questionnaire that was developed. The questionnaire was posted online using LimeSurvey. The link to the questionnaire was sent to the leadership of the organisations. A covering letter together with the survey was distributed to all participants explaining the rationale of the research, their rights to anonymity, and their rights to decline participation at any stage of the research process. The researcher had full access to the databases of the raw data. The researcher retrieved the raw data on a daily basis and saved it on an external hard drive. The survey was allowed to run for a period of three weeks from the date of inception after which the link to the survey was deactivated. A total of 220 respondents who replied. The responses of the seven-point Likert-type scale was then sent to the statistician who used the raw data to provide the statistical

analysis that was presented in Chapter 5. After the 10 factors had been confirmed, structural equation modelling was undertaken to identify the relationships between the factors.

Therefore, the sequential exploratory mixed methods were satisfactory in addressing the methodology.

6.3.3 Objective 3

To formulate the framework statistically using the data from objective 2

The ultimate objective of this research was to develop a framework that can be used by management to integrate management systems in a structured manner towards improving efficiency in an organisation. From objective 2, the factors identified are leadership, management, organisational culture, employee motivation, policy, standards, standardisation effort, innovation, employee performance and efficiency.

The framework addressed two parts of the IMS namely –

- organisations who have management systems and have not yet integrated them but intended to pursue this option; and
- organisations who already had an existing management system but had not successfully benefited from the IMS.

The research focused on organisational factors as antecedents to inform the developed framework. From the empirical investigations, it became evident that organisations should adopt a structured framework to improve efficiency. Furthermore, three stages were chosen and each stage focused on important factors for an IMS as presented in Figure 5.7.

A framework for the integration of management systems in organisations includes factors that contribute to organisational efficiency (Asif et al., 2011; Denison & Spreitzer,1991). The empirically developed IMS framework could be used to improve efficiency of an organisation by implemeting the 3 stages as identified in the framework. This framework is unique as it presents an organised and structured manner that consists of internal embeddedness and the inter-relationships between the three stages of an organisation. If the framework is properly implemented organisations will achieve competitive advantage (Almeida et al., 2014) and increased financial sustainability (Asif et al., 2009). The framework that was developed solidifies theory and empirically presents all tested constructs in a structured manner. Therefore, this research has covered these aspects adequately.

6.4 DISCUSSION OF THE RESEARCH OUTPUT

The primary research output was the developed framework for organisations. There were 10 significant factors that emerged from the statistical factor analysis and structural equation modelling that informed the newly developed framework. The research showed that organisations must adopt a holistic framework that addresses antecedents, processes and outputs when addressing the IMS.

As discussed in the literature (see 2.5.1), integration is a process and not a consequence of an outcome. Integration transforms the organisation through a number of fundamental changes at the strategic level (stage 1: conception), business level (stage 2: combination), and operational level (stage 3: standardisation). At the strategic level, it provides a tool for collaboration with stakeholders and paves the way to address their concerns. At business level, it focuses on the design of an integrated management manual, work instructions and processes, by which integration could be evaluated. At operational level (stage 3), the work instructions or procedures and processes are standardised. Supporting activities, such as auditing and general administration, are also designed accordingly in order to promote efficiency, save resources and reduce confusion amongst employees at the operational level.

The empirical framework also shows that innovation, policy and standards along the various other factors is required for continuous improvement. New knowledge needs to be integrated with both the explicit and tacit knowledge of the organisation. Integration with explicit knowledge will focus on manuals, procedures, databases, work instructions, and other key documents. Integration with tacit knowledge will focus on employees' experiences and skills. The integration of new knowledge and novel experiences will help to prepare the organisation better to address the anticipated and unanticipated challenges associated with corporate sustainability.

IMS is seen as a viable organisational approach to cost reduction, operational improvement, employee motivation, efficient management and utilisation of resources, and a means to better compliance with social obligations and different stakeholders' requirements. However, difficulties have been faced in IMS implementation (integration of individual management systems and their implementation) due to a lack of formal MSSs for IMSs and unavailability of methodologies for IMS implementation. The current research provided the core factors to provide one composite and holistic framework.

IMS implementation can be facilitated through enablers such as securing management's full support, commitment, addressing the IMS in strategic planning, allocating and prioritising

resources, establishing goals, milestones for IMSs, involvement of end-users in the design and implementation phase, support of IMS experts and fostering a culture of teamwork. The framework approach counts upon feedback as the dynamising process to design, implement and improve the IMS.

Moreover, top management involvement and commitment are critical to a successful management system integration. This commitment influences the alignment of management subsystems with the organisation business plans and promotes organisation commitment. Management commitment is one of the most important factors at an early stage (Boys & Wilcock, 2014). Nowadays, the adoption of an IMS is an important strategic decision in order to promote higher levels of competitiveness and sustainability (De Oliveira Matias & Coelho, 2010). As a successful management system, integration is significantly related to employee motivation. To achieve this effectiveness, organisations need to comply with a set of factors (through the framework) that would lead to a successful integration and better system control. Managers consequently need to recognise that for the IMS to be implemented and maintained, they must continuously push it forward.

Regarding the IMS, it is important to highlight how an organisation that starts to build or improve the existing IMS retains a focus on the requirements of all stakeholders. In developing an IMS practically, Chang et al. (2014) showed that the success of an IMS may not be standardisation as the first priority during the integration process. The starting point is the understanding of the prior conditions, stages of integration and ultimately achieving organisational efficiency. When implementing the IMS framework, the existing organisational culture must also be taken into consideration to ensure maximum benefit is obtained.

6.5 RESEARCH THEORETICAL OUTCOME

During the research of IMSs, many researchers (such as Asif, 2009; Bernado et al., 2015; Dordević et al., 2010) tried to identify the best way to improve organisational efficiency by emphasising management systems with the best practices. While an IMS is recognised as critical for organisations, operating with three or more management systems in parallel, can be risky. This research proposes a new conceptual IMS framework, which includes independent and dependent variables as outlined. The interconnected relationships between these practices were reviewed and at the same time, the conceptual framework will provide a useful theoretical foundation for the existence of management systems towards organisational efficiency.

6.6 ORIGINAL CONTRIBUTION TO THE BODY OF KNOWLEDGE

Whilst most studies on IMS have shown the factors (Carvalho et al., 2015; Rebelo et al., 2014), benefits (Asif et al., 2009; Carvalho et al., 2015) and challenges (Vitoreli & Carpinetti, 2013; Almeida et al., 2014) for ensuring IMS success, these studies have been conducted in isolation. The relationship between the factors of IMS have received little attention, leaving a knowledge gap in the academic area and from a practitioner perspective, in that, the relationship between the factors and how they jointly influence organisational efficiency is not known.

There are 3 contributions by this study.

Firstly, antecedents of IMSs in African countries is largely unknown. Considering that there is a paucity of empirical evidence on the antecedents of IMSs, this research will close that gap. In view of the fact that most previous research has been done outside the borders of South Africa and Africa itself, as evidenced from the literature, this research will make a significant contribution to the study of IMSs in the South African context.

Secondly, the research also provided the opportunity to create a new definition for integration in management in the field of business management. In consideration of the definitions derived by prominent authors (such as Blau, 1960; Ramphal, 2012) the current research has attempted to provide a definition congruent to sceptics from the era (such as Galtung, 1966; Ackoff, 1999a) and to the empirical base of this research.Finally, the framework that was validated emanated from the conceptual framework and the 10 significant factors that emerged through confirmatory factor analysis and structural equation modelling which provided the causal associations between the factors. The significant factors that emerged from the research were leadership, management, organisational culture, employee motivation, policy, innovation, standards, standardisation effort, employee performance and efficiency. Hence, these factors informed the framework through subjective and objective measures, which is considered to be the original contribution to the body of knowledge.

6.7 BENEFITS OF THE RESEARCH

The influence of the factors on IMS on organisational performance, although being well documented is limited to mostly developed countries. Therefore, the benefit of this research will add to the scant research conducted in developing countries.

6.8 OUTCOME OF THE STUDY

The IMS framework will have a direct effect by addressing the high unemployment rate in South Africa, which will result in improving the efficiency of organisations, thereby resulting in job creation.

6.9 LIMITATIONS

The research focused only on ICT organisations as these were the organisations that develop, implement and continuously improve management systems for organisations. However, due to time and scope of this research SMME ICT organisations were overlooked.

6.10 RECOMMENDATIONS

Based on the findings of this research the following recommendations are given:

Firstly, the study found that organisations are not equipped with an effective tool to address IMS due to its complexity. Therefore, it is recommended that as an initial step, organisations that have implemented more than two IMSs conduct an audit to ascertain their level of integration before implementing the empirically developed framework.

Secondly, it is recommended that this framework should be used by entrepreneurial organisations who have more than two management systems operating in parallel. This will improve their efficiency and will be able to contribute to the overall effectiveness of their organisation.

Finally, considering African countries lack of understaning on IMS, this research should be tested for validity in another African country.

6.11 SUGGESTIONS FOR FURTHER RESEARCH

Cross-interdisciplinary integration is becoming an interesting focus area for future research. Meeting grand challenges requires responses that constructively combine multiple forms of expertise, both academic and non-academic, that is, it requires cross-disciplinary integration. Given their complexity, this will require multiple forms of expertise. At a minimum, experts from multiple academic disciplines are necessary. Typically, however, a broad range of expertise is needed, including stakeholder, private sector and governmental expertise. A framework that encompasses all perspectives for an IMS with a view of improving the county's economy would be critical in a sector that is not contributing positively.

Culture determines the identity of the organisation, and this is usually strongly influenced by the history of the organisation. It will be interesting to research the effect of deep-rooted practices on the actual practice of integration, as this is associated with the changing economy and challenges, especially in South Africa. The South African organisational landscape has been diversified since 1994, so future research will definitely add value to the topic of IMS.

Empirically, the research also found a negative relationship between standards and standardisation effort. The correlation between the standardisation effort and policy (-0.728) was evident. This correlation was significant as it showed that the standardisation effort affects standards negatively. This in turn will not improve the efficiency of the organisation. Literature (see Anupindi et al., 2006) indicates that the standardisation effort and standards are positively associated and the amount of effort expended should see a proportional increase in organisational efficiency. This can be a potential area for future research activities in this field.

More research about how integration of management systems could be developed to stimulate and improve innovation through standardisation is also recommended.

6.12 CHAPTER SUMMARY

The achievement of each objective was discussed with evidence provided. The contribution of the study was presented and interestingly, many areas were identified for future research. The research was concluded in this chapter.

REFERENCE LIST

Abad, J., Cabrera, H.R. & Medina, A. 2014. An analysis of the perceived difficulties arising during the process of integrating management systems. *Journal of Industrial Engineering and Management*, 9(3):860-878.

Abrahamsson, S., Hansson, J. & Isaksson, R. 2010. Integrated management systems: Advantages, problems and possibilities. *Total Quality Management*, 28(6):67-69.

Ackoff, R.L. 1999a. *Ackoff's best: His classic writings on management*. New York, NY: Wiley.

Ackoff, R.L. 1999b. *Re-creating the corporation: A design of organisations for the 21st century*. New York, NY: Oxford University Press.

Allen, R.H. & Sriram, R.D. 2000. The role of standards in innovation. *Technological Forecasting and Social Change*, 64(2/3):171-181.

Allen, T.J. & Morton, M.S.S. 1994. *Information technology and the corporation of the 1990s: Research studies*. New York: Oxford University Press.

Almeida, J., Domingues, P. & Sampai, P. 2014. Different perspectives on management systems integration. *Total Quality Management*, 25(4):338-351.

Anastasiu, L. 2009. How the changing of technology can become a motivating factor in human resources management. In *Proceedings on the 5th International Seminar Quality Management in Higher Education*, Alexandroupolis, Greece.

Anderson, C. 2005. How to build effective management systems. *Bizmanualz*, Vol. 26.

Anderson, N.H. & Butzin, C.A. 1974. Performance = motivation and ability: An integration theoretical analysis. *Journal of Personality and Social Psychology*, 30(5):598-604.

Anderson, N.H. 1971. Integration theory and attitude change. *Psychological Review*, 78:171-206.

Anderson, N.H. 1981. *Foundations of information integration theory*. London: Academic Press.

Anderson, N.H. 1982. *Methods of information integration theory*. London: Academic Press.

Anderson, N.H. 1991. Contributions to information integration theory: Vol 1. *The American Journal of Psychology*, 107(3):446-449.

Anderson, N.H. 1991. *Contributions to information integration theory*. Vols. 1, 2, 3. Hillsdale, NJ: Erlbaum Associates.

Anderson, N.H. 1996. *A functional theory of cognition*. Hillsdale, NJ: Erlbaum.

Anderson, P. & Tushman, M.L. 1990. Technological discontinuities and dominant designs: A cyclical model of technological change. *Administrative Science Quarterly*, 35:604-633.

Ansoff, I. 1965. *Corporate strategy*. New York: McGraw Hill.

Anupindi, R., Chopra, S., Deshmukh, S.D., Van Mieghem, J.A. & Zemel, E. 2006. *Managing business process flows: Principles of operations management*. Second edition. Upper Saddle River, NJ: Prentice Hall.

Arbuckle, J.L. 2007. *Amos 16: User's guide*. Chicago, IL: SPSS.

Archer, M. 1996. Social integration and system integration: Developing the distinction. *Journal of Sociology*, 30(4):679-699.

Arespa, M. 2015. Macroeconomic volatility and international integration. *Bulletin of Economic Research*, 67(4):393-410.

Argyris, C. & Schoen, D. 1978. *Organizational learning*. Reading, MA: Addison-Wesley.

Arthur, W.B. 1989. Competing technologies, increasing returns, and lock-in by historical events. *Economic Journal*, 99:116-131.

Arthur, W.B. 1994. *Increasing returns and path dependence in the economy*. Ann Arbor, MI: University of Michigan Press.

Asif, M., Bruijn, E., Fisscher, O., Searcy, C. & Steenhuis, H. 2009. Process embedded design of integrated management systems. *Journal of Quality & Reliability Management*, 26(3):261-282.

Asif, M., Fisscher, O., Bruijn, E. & Pagell, M. 2010. Integration of management systems: A methodology for operational excellence and strategic flexibility. *Operations Management Research*, 3:146-160.

Asif, M., Searcy, C., Zutshi, A. & Ahmad, N. 2011. An integrated management systems approach to corporate sustainability*. European Business Review,* 23(4):353-367.

Asif, M., Searcy, C., Zutshi, A. & Fisscher, O.A.M. 2013. An integrated management systems approach to corporate social responsibility. *Journal of Cleaner Production*, 56:7-17. doi: 10.1016/j.jclepro.2011.10.034

Avery, G.C. & Bergsteiner, H. 2011a. *Sustainable leadership: Honeybee and locust approaches*. International version. New York: Routledge.

Avery, G.C. & Bergsteiner, H. 2011b. Sustainable leadership practices for enhancing business resilience and performance. *Strategy & Leadership*, 39(3):5-15.

Avison, D., Jones, J., Powell, P. & Wilson, D. 2004. Using and validating the strategic alignment model. *The Journal of Strategic Information Systems*, 13(3):223-246.

Bahmani, Z. & Farhadpoor, R.M. 2017. The effect of environmental uncertainty and characteristics of information sources on managers use of information sources for making decisions. *International Journal of Information, Business and Management*, 9(1):168-191.

Baird, J.A. 2009. Macro and micro influences on assessment practice. *Assessment in Education: Principles, Policy & Practice*, 16(2):127-129.

Baker, C.R. & Barbu, E.M. 2007. Evolution of research on international accounting harmonization: A historical and institutional perspective. *Socio-Economic Review*, 5(4):603-632.

Balassa, B. 1961. *Towards a theory of economic integration* (2nd edition). London: Allew and Unwin.

Baldi, D. 1999. Understanding integrated management systems audit. *Quality in Manufacturing*, March/April. Retrieved from http://www.manufacturingcenter.com/qm/archives/0399/399ims.asp

Barlow, C. & Waldrop, M. 1994. Worldview extensions of complexity theory. In C. Barlow (ed.). *Evolution extended: Biological debates on the meaning of life.* Cambridge, MA: The MIT Press.

Barney, J.B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17:99-120.

Barua, A., Kriebel, C.H. & Mukhopadhyay, T. 1995. Information technologies and business value: An analytic and empirical investigation. *Information Systems Research*, 6(1):3-23.

Bateson, G. 1972. *Steps to an ecology of mind.* New York, NY: Ballantine Books.

Beckert, J. 1999. Agency, entrepreneurs, and institutional change: The role of strategic choice and institutionalized practices in organisations. *Organization Studies*, 20(5):777-799.

Beckmerhagen, I., Berg, H., Karapetrovic, S. & Willborn, W. 2003. Integration of management systems: Focus on safety in the nuclear industry. *International Journal of Quality and Reliability Management*, 20(2):210-228.

Beimborn, D., Gleisner, F., Joachim, N. & Hackethal, A. 2009. The role of process standardization in achieving IT business value. In *Proceedings of the 42nd Hawaii International Conference on System Sciences (HICSS 2009),* Hawaii, HI: IEEE.

Bénézech, D., Lambert, G., Lanoux, B., Lerch, C. & Loos-Baroin, J. 2001. Completion of knowledge codification: An illustration through the ISO 9000 standards implementation process. *Research* Policy, 30:1395-1407.

Bennis, W. 2003. Flight of the phoenix: Authentic leaders find a way to fly. *Executive Excellence*, 20(5):2-5.

Benson, D. 2016. In pursuit of increased leadership effectiveness. *Physician Leadership Journal (Tampa)*, 3(5):54-57.

Berkowitz, L. (ed.). 1974. *Advances in experimental social psychology.* Vol. 7. San Diego, CA: Academic Press.

Bernardo, M. 2014. Integration of management systems as an innovation: A proposal for a new model. *Journal of Cleaner Production*, 82:132-142. doi: 10.1016/j.jclepro.2014.06.089

Bernardo, M., Casadesús, M. & Karapetrovic, S. 2011. Are methods used to integrate standardized management systems a conditioning factor of the level of integration? An empirical study. *International Journal for Quality Research,* 5(3):213-222.

Bernardo, M., Casadesús, M., Karapetrovic, S. & Heras, I. 2009. How integrated are environmental, quality and other standardized management systems? An empirical research. *Journal of Cleaner Production*, 17:742-750.

Bernardo, M., Casadesús, M., Karapetrovic, S. & Heras, I. 2010. An empirical research on the integration of management system audits. *Journal of Cleaner Production*, 18:486-495.

Bernardo, M., Casadesús, M., Karapetrovic, S. & Heras, I. 2011. Relationships between the integration of audits and management systems: An empirical study. *Total Quality Management*, 26(6):659-672.

Bernardo, M., Casadesús, M., Karapetrovic, S. & Heras, I. 2012. Integration of standardized management systems: Does the implementation order matter? *International Journal of Operations & Production Management*, 32(3):291-307.

Bernardo, M., Simon, A., Tari, J.J. & Molina-Azorín, J.F. 2015. Benefits of management systems integration: A literature review. *Journal of Cleaner Production*, 94:260-267.

Bertram, D. 2015. *Likert scales. CPSC 681 – topic report.* Retrieved from http://poincare.matf.bg.ac.rs/~kristina/topic-dane-likert.pdf [Accessed 1 November 2016].

Black, J.A. & Boal, K.B. 1994. Strategic resources, traits, configurations and paths to sustainable competitive advantage. *Strategic Management Journal*, 15(S2):131-148.

Blake, R.R. & Mouton, J.S. 1978. *The new managerial grid*. Houston, TX: Gulf.

Blau, M.P. 1960. A theory of social integration. *The American Journal of Sociology*, 115(6):545-556.

Blaxter, L., Hughes, C. & Tight, M. 1996. *How to research.* Buckingham: Open University Press.

Blind, K. & Gauch, S. 2009. Research and standardisation in nanotechnology: Evidence from Germany. *The Journal of Technology Transfer*, 34(3):320-342.

Blind, K. 2013. *The impact of standardization and standards on innovation*. Nesta working paper 13/15. Retrieved from www.nesta.org.uk/wp13-15 [Accessed 5 June 2015].

Bloomberg. 2012. *2012 global M&A outlook*. Retrieved from http://media.bloomberg.com/bb/avfile/ru20IiusvjMM [Accessed 3 July 2012].

Bobrek, M. & Sokovic, M. 2006. Integration concept and synergetic effect in modern management. *Journal of Materials Processing Technology*, 175(1-3):33-39.

Boddewyn, J.J. & Grosse, R. 1995. American marketing in the European Union: Standardization's uneven progress. *European Journal of Marketing*, 29(12):23-42.

Boiral, O. & Heras-Saizarbitoria, I. 2015. Managing biodiversity through stakeholder involvement: Why, who, and for what initiatives? *Journal of Business Ethics*, 140:403-421.

Boli, J. & Thomas, G.M. 1999. *Constructing world culture: International nongovernmental organisations since 1875*. Stanford, CA: Stanford University Press.

Borchert, P.S. & Cardozo, R.N. 2010. Creative destruction and creative combination. *Journal of Applied Management and Entrepreneurship*, 15(2):64-75.

Botha, S. & Claassens, M. 2010. Leadership competencies: The contribution of the Bachelor in Management and Leadership (BML) to the development of leaders at First National Bank, South Africa. *International Business and Economics Research Journal*, 9(10):77-87.

Botzem, S. & Dobusch, L. 2012. Standardization cycles: A process perspective on the formation and diffusion of transnational standards. *Organization Studies*, 33(5/6):737-762.

Botzem, S. 2012. *The politics of accounting regulation: Organizing transnational standard setting in financial reporting*. Cheltenham: Edward Elgar.

Boudreau, K.J. & Lakhani, K.R. 2009. How to manage outside innovation. *MIT Sloan Business Review*, 50(4):69-76.

Bourne, M.C. 2008. Researching performance measurement system implementation: The dynamics of success and failure. *Production Planning and Control*, 16(2):101-13.

Bousquet, A. & Curtis, S. 2011. Beyond models and metaphors: Complexity theory, systems thinking and international relations. *Cambridge Review of International Affairs*, 24(1):43-62.

Boyne, G.A., Gould-Williams, J.S., Law, J. & Walker, R.M. 2005. Explaining the adoption of innovation: An empirical analysis of public management reform. *Environment and Planning C: Government and Policy,* 23:419-435.

Boys, C.A. & Wilcock A.E. 2014. Improving integration of human resources into quality management system standards. *International Journal of Quality & Reliability Management*, 31(7):738-750.

Brady, R.A. 1933. *The rationalization movement in German industry.* Berkeley, CA: University of California Press.

Brandt, L.K. 2010. Making immigrant integration work: A case research of refugee resettlement in Philadelphia, PA. Unpublished degree thesis. Iowa State University.

Breene, T. & Nunes, P.F. 2006. Going the distance: How the world's best companies achieve high performance. *High Performance Business*, 3.

Brinkerhoff, R.O. 2005. The success case method: A strategic evaluation approach to increasing the value and effect of training. *Advances in Developing Human Resources*, 7(1):86-101.

Brodbeck, P.W. 2002. Complexity theory and organisation procedure design. *Business Process Management Journal*, 8(4):377-402.

Bryman, A. 2012. *Social research methods*. Fourth edition. Oxford: Oxford University Press.

BSI (British Standards Institute). 2006. *Introducing standards*. London.

Buford, J.A. & Bedeian, A.G. 1988. *Management in extension* (2nd edition). Columbus, Ohio: Ohio State University Extension.

Buhl-Hansen, B., Christensen, J.O., Eliassen, A., Jørgensen, L.P. & Vestergaard, J. 2008. Integrated management systems: barriers, lessons and advantages. Mini dissertation in technology.

Burita, L. & Zeman, K. 2017. Architecture approach in systems development. *Journal of Systems Integration*, (1):31-44.

Burke, R.J. 2006. *Research companion to working time and work addiction*. Cornwall: MPG Books.

Büthe, T. & Mattli, W. 2011. *The new global rulers*. Princeton, NJ: Princeton University Press.

Cameron, K.S. & Freeman, S.J. 1985. Cultural congruence, strength, and type: Relationships to effectiveness*. Research in Organizational Change and Development*, 5:23-58.

Candel, J.J.L. & Biesbroek, R. 2016. Toward a processual understanding of policy integration. *Policy Science,* 49(3):211-231*.* doi: 10.1007/s11077-016-9248-y

Capra, F. 1997. *The web of life: A new synthesis of mind and matter*. London: Flamingo.

Carvalho, K.M.P., Picchi, F., Camarini, G. & Chamon, E.M.Q.O. 2015. Benefits in the implementation of safety, health, environmental and quality integrated system. *International Journal of Engineering and Technology*, 7(4):333-338.

Castillo-Rojas, S.M., Casadesus, M., Karapetrovic, S., Coromina, L., Heras, I. & Martín, I. 2012. Is implementing multiple management system standards a hindrance to innovation? *Total Quality Management and Business Excellence*, 23(9/10):1075-1088.

Castka, P. & Balzarova, M.A. 2007. A critical look on quality through CSR lenses: Key challenges stemming from the development of ISO 26000. *International Journal of Quality & Reliability Management*, 24(7):738-752. doi: 10.1108/02656710710774700

Castro, M. & Martins, N. 2010. The relationship between organisational climate and employee satisfaction in a South African information and technological organisation. *South African Journal of Industrial Psychology*, 36(1):1-9.

Cater, T. & Pucko, D. 2010. Factors of effective strategy implementation: Empirical evidence from Slovenian business practice. *Journal for East European Management Studies,* 15(3):207-236.

Chabot, S. 2000. Transnational diffusion and the African American reinvention of the Gandhian repertoire. *Mobilization*, 5(2):201-216.

Chan, Y.C.L. 2004. Performance measurement and adoption of balanced scorecards: A survey of municipal governments in the USA and Canada. *The International Journal of Public Sector Management*, 17(3):204-221.

Chan, Y.K., Gaffney, P., Neailey, K., & Ip, W.H. 1998. The establishment of an integrated management system - a paradigm for railway engineering management. *TQM Magazine*, 10(6):420-424. doi: 10.1108/09544789810239146

Chandler, G.N., DeTienne, D., McKelvie, A. & Mumford, T.V. 2011. Causation and effectuation processes: A validation study. *Journal of Business Venturing,* 26(3):375-390.

Chang, S.I., Chang, I. & Wang, T. 2014. Information systems integration after merger and acquisition. *Industrial Management & Data Systems*, 114(1):37-52.

Chen, R.-Y. 2016. Knowledge-based innovative Lean Service Life Cycle Evaluation Model for Training System. *International Journal of Innovation, Management and Technology*, 7(5):171-176.

Choi, D.G., Lee, H. & Sung, T. 2011. Research profiling for “standardization and innovation”. *Scientometrics*, 88(1):259-278.

Choo, C.W. 1996. The knowing organization: How organizations use information to construct meaning, create knowledge and make decisions. *International Journal of Information Management*, 16(5):329-340.

Chou, H.-W., Lin, Y.-H., Chang, H.-H. & Chuang, W.W. 2013. Transformational leadership and team performance: The mediating roles of cognitive trust and collective efficacy. *SAGE Open*, July-September:1-10.

City of Philadelphia, Mayor’s Office. 2008a. *Executive order no. 9-08*. Retrieved from https://ework.phila.gov/philagov/news/prelease.asp?id=413 [Accessed 10 April 2010].

City of Philadelphia, Mayor’s Office. 2008b. *Speech to the Philadelphia City Planning Commission*. Retrieved from http://www.designadvocacy.org/docs/NutterPCPCSpeech-080617.pdf [Accessed 10 April 2010].

Cook, H.E. 1997. *Product management: Value, quality, cost, price, profit and organization*. London: Chapman & Hall.

Cooper, D.R. & Schindler, P.S. 2003. *Business research methods* (8th edition). New York, NY: McGraw-Hill.

Cortes, K.E. 2004. Are refugees different from economic immigrants? Some empirical evidence on the heterogeneity of immigrant groups in the United States. *The Review of Economics and Statistics*, 86:465-480.

Covey, S. 2003. Seven habits revisited. *Executive Excellence*, 20(5):7-8.

CQI (Chartered Quality Institute). 2007. Retrieved from http://www.thecqi.org/resources/d2-6.shtml

Cresswell, J.W. 2014. *Research design: Qualitative, quantitative, and mixed methods approaches*. Fourth edition. Thousand Oaks, CA: Sage.

Crosbie, R. 2005. Learning the soft skills of leadership. *Industrial and Commercial Training*, 37(1):45-51.

Crowder, M. 2013. Quality standards: Integration within a bereavement environment. *The TQM Journal*, 25(1):18-28.

Daft, R.L. & Weick, K.E. 1984. Toward a model of organisations as interpretation systems. *Academic of Management Review*, 9:284-295.

Dalling, I. 2007 *Integrated management system. Definition and guidance on structuring.* Retrieved from http://forum.thecqi.org/forum/attach.aspx/147/IMSIG%20IQA%20Integrated%20Management%20System%20definition%20and%20structuring%20guidance%20-%20Draft%201d.pdf

Damanpour, F. 1991. Organisational innovation: A meta-analysis of effects of determinants and moderators. *Academic of Management Journal*, 34:555-590.

Davenport T.H. 2005. The coming commodization of processes. *Harvard Business Review*, July: 1-8.

Davenport, T.H. & Short, J.E. 1990. The new industrial engineering: Information technology and business process redesign. *MIT Sloan Management Review*, 31(4):11-27.

David, P. 1985. Clio and the economics of QWERTY. *American Economic Review*, 75(2):332-37.

David, P.A. & Greenstein, S. 1990. The economics of compatibility standards: An introduction to recent research. *Economics of Innovation and New Technologies*, 1:3-41.

David, P.A. & Rothwell, G.S. 1996. Standardization, diversity and learning: Strategies for the coevolution of technology and industrial capacity. *International Journal of Industrial Organization*, 14(2):181-201.

Davies, A., Brady, T. & Hobday, M. 2008. Charting a path toward integrated solutions. *MIT Sloan Management Review*, 37(3):39-48.

De Oliveira Matias, J.C. & Coelho, D.A. 2010. The integration of the standards systems of quality management, environmental management and occupational health and safety management. *International Journal of Production Research*, 40(1):3857-3866.

De Vries, H.J.J. & Verhagen, W.P. 2016. Impact of changes in regulatory performance standards on innovation: The case of energy performance standards for new built houses. *Technovation*, 56-68.

Deming, W.E. 1986. *Out of the crisis*. Cambridge, MA: MIT.

Denison, D.R. & Spreitzer, G.M. 1991. Organizational culture and organizational development. In R.W. Woodman & W.A. Pasmore (eds.). *Research in organizational change and development.* Vol. 5. Greenwich, CT: JAI Press, 1-22.

Dent, E.B. 2003. The complexity science organizational development practitioner. *Organization Development Journal*, 21(2):82-86.

Denzin, N.K. & Lincoln, Y.S. 2000. *Qualitative research*. London: Sage.

Dess, G.G. & Davis, P.S. 1984. Porter's generic strategies as determinants of strategic group membership and performance. *Academy of Management Journal*, 26:467-488.

DeTienne, D.R., Shepherd, D.A. & DeCastro, J.O. 2007. The fallacy of "only the strong survive": The effects of extrinsic motivation on the persistence decisions for under-performing firms. *Journal of Business Venturing*, (23):528-546.

Devereux, B. & Costello, F. 2005. Investigating the relations used in conceptual combination. *Artificial Intelligence Review*, 24:489-515.

Doan, M.P. 2011. The roles of systematic skewness and systematic kurtosis in asset pricing. Unpublished PhD thesis. Melbourne: RMIT University.

Dolfsma, W. & Seo, D. 2013. Government policy and technological innovation: A suggested typology. *Technovation*, 33:173-179.

Domingues, J.P.T., Sampaio, P. & Arezes, P.M. 2012. New organizational issues and macroergonomics: Integrating management systems. *International Journal of Human Factors and Ergonomics*, 1(4):351-375.

Domingues, J.P.T., Sampaio, P. & Arezes, P.M. 2015. Integrated management systems as complex adaptive systems. In *Proceedings of the 8th WOS.net International Conference*, Porto.

Domingues, P., Paulo Sampaio, P. & Arezes, P.M. 2016. Integrated management systems assessment: A maturity model proposal. *Journal of Cleaner Production*, 124:164-174.

Donaldson, T. & Preston, L.E. 1995. The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review*, 20(1):65-91.

Dordević, D., Bešić, C., Milošević, D. & Bogetić, B. 2010. Development of integrated management systems in SMEs in Serbia. *Management Journal*, 5(2):99-114.

Douglas, A. & Glen, D. 2000. Integrated management systems in small and medium enterprises. *Total Quality Management*, 11:686-690.

Drucker, P.F. 1998. The coming of the new organisation. *Harvard Business Review on Knowledge Management,* 1-19.

Drucker, P.F. 2006. They're not employees, they're people. *Harvard Business Review*, 84(2):144-152.

Du Toit, G.S., Erasmus, B.J. & Strydom, J.W. 2010. *Introduction to business management.* Cape Town: Oxford University Press.

Durkheim, E. 1966. *The rules of sociological method*. New York, NY: Free Press.

Eastmond, M. 2011. Egalitarian ambitions, constructions of difference: The paradoxes of refugee integration in Sweden. *Journal of Ethnic and Migration Studies*, 37(2):277-295.

Eccles, R.G., Lanes, K.L. & Wilson, T.C. 1999. Are you paying too much for that acquisition? *Harvard Business Review*, 77(4):136-144.

ECRE (European Council on Refugees and Exiles). 1999*. Position on the integration of refugees in Europe*. London.

Eden, C., Ackermann, F., Bryson, J.M., Richardson, G.P., Andersen, D.F. & Finn, C.B. 2008. Integrating modes of policy analysis and strategic management practice: Requisite elements and dilemmas. *Journal of the Operational Research Society*, 60(1):2-13.

Egyedi, T.M. & Sherif, M.H. 2010. Standards dynamics through an innovation lens: Next-generation Ethernet networks. *IEEE Communications Magazine*, 48(10):166-171.

Eiselen, R., Uys, T. & Potgieter, N. 2005. *Analysing survey data using SPSS13: A workbook*. Johannesburg: University of Johannesburg.

Elsner, F., Centeno, C. & Ellershaw, J.E. 2016. Early integration needs early education. *Palliative Medicine*, 30(9):805-806.

Entzinger, H. 2000. The dynamics of integration policies: A multidimensional model. In R. Koopmans & P. Statham (eds.). *Challenging immigration and ethnic relations politics: Comparative European perspectives*. Oxford: Oxford University Press, 97-118.

Esser, H. 2004. Does the 'new' immigration require a 'new' theory of intergenerational integration? *International Migration Review*, 38(3):1126-1159.

European Commission. 2011. *A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European Economy by 2020*. Brussels.

Eustace, A. & Martins, N. 2014. The role of leadership in shaping organisational climate: An example from the fast moving consumer goods industry. *SA Journal of Industrial Psychology*, 40(1):112-120.

Evans, G.E., Ward, P.L. & Rugaas, B. 2009. *Management basics for information professional.* New York, NY: Neal-Schuman Publishers.

Farrell, J. & Saloner, G. 1985. Standardization, compatibility and innovation. *The RAND Journal of Economics*, 16(1):70-83.

Farrell, J. & Saloner, G. 1986. Installed base and compatibility: Innovation, product preannouncements, and predation. *The American Economic Review,* 76:940-955.

Faulder, T.R. 2005. Technology integration: A research based professional development program. Unpublished M.Ed. thesis. Education Department, Cedarville University.

Fayol, H. 1949. *General and industrial management*. London: Isaac Pitman.

Featherston, C.R., Jae-Yun, H.-Y., Brévignon-Dodin, L. & O'Sullivan, E. 2016. Mediating and catalising: A framework for anticipating the standardisation needs of emerging technologies. *Technovation,* 25-40.

Feng, J., Li, J., Gao, J. & Hua, Z. 2012. A combination model for operational risk estimation in a Chinese banking industry case. *The Journal of Operational Risk*, 7(2):17-39.

Ferguson, M.C., García, M., & Bornay, M.M. (2002). Modelos de implantación de los sistemas integrados de gestión de la calidad, el medio ambiente y la seguridad. *Investigaciones Europeas de Dirección y Economía de la Empresa,* 8(1):97-118.

Fiedler, F.E. 1978. Contingency model of leadership effectiveness. In L. Berkowitz (ed.). *Advances in experimental social psychology*, Vol. 11. New York, NY: Academic Press, 60-112.

Field, A. 2000. *Discovering statistics using SPSS for Windows*. London: Sage.

Field, A. 2005. *Discovering statistics using SPSS*. Second edition. London: Sage.

Fishbein, M. 1967. A behavioral theory approach to the relations between beliefs about an object and attitude toward that object. In M. Fishbein (ed.). *Readings in attitude theory and measurement*. New York, NY: Wiley, 389-400.

Fitch, D. & Jagalino, N.C. 2012. Examining organisational functioning through the lens of complexity theory using system dynamics modelling. *Journal of Social Service Research*, 38:591-604.

Fletcher, R. 2009. Ecotourism discourse: Challenging the stakeholders theory. *Journal of Ecotourism*, 8(3):269-285.

Flood, R.L. & Carson, E.R. 1993. *Dealing with complexity: An introduction to the theory and application of systems science*. New York, NY: Springer.

Fomin, V. & Lyytinen, K. 2000. How to distribute a café Wonderland or radio engineers' gang in the Nordic countries? In K. Jakobs (ed.). *Information technology standards and standardization: A global perspective.* Hershey, PA: Idea Group, 222-239.

Foray, D. 1998. Standards and innovation in technological dynamics. *Standard View*, 6(2):81-84.

Fornell, C. & Larcker, D. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1):39-50.

Frank Wiengarten, F., Lo, C.K.Y. & Lam, J.Y.K. 2015. How does sustainability leadership affect firm performance? The choices associated with appointing a chief officer of corporate social responsibility. *Journal of Business Ethics*, 140:477-493.

Fredendall, L.D., Craig, J.B., Fowler, P.J. & Damali, U. 2009. Barriers to swift, even flow in the internal supply chain of perioperative surgical services department: A case study. *Decision Sciences*, 40(2):327-349.

Freeman, R.E. & Reed, D.L. 1983. Stockholders and stakeholders: A new perspective on corporate governance. *California Management Review*, 25(3):88-106.

Freeman, R.E. 1984. *Strategic management: A stakeholder approach*. Boston, MA: Pitman.

Freeman, R.E. 1994. The politics of stakeholder theory: Some future directions. *Business Ethics Quarterly*, 4(4):409-421.

Freeman, R.E., Harrison, J.S. & Wicks, A.C. 2007. *Managing for stakeholders: Survival, reputation and success.* New Haven, CT: Yale University Press.

Freeman, R.E., Harrison, J.S., Wicks, A.C., Parmar, B.L. & DeColle, S. 2013. *Stakeholder theory: The state of the art.* Third edition. Cambridge: Cambridge University Press.

Fresner, J. & Engelhardt, G. 2004. Experiences with integrated management systems for two small companies in Austria. *Journal of Cleaner Production*, 12(6):623-631.

Freud, S. 1922. *Group psychology and the analysis of the ego*. New York, NY: Boni and Liveright.

Fuller, E.L. Jr. & Hemmerle, W.J. 1966. Robustness of the maximum-likelihood estimation procedure in factor analysis. *Psychometrika*, 31(2):255-266.

Funk, J.L. & Luo, J. 2015. Open standards, vertical disintegration and entrepreneurial opportunities: How vertically-specialized firms entered the U.S. semiconductor industry. *Technovation*, 45:52-62.

Gagné, C.L. & Shoben, E.J. 1997. Influence of thematic relations on the comprehension of modifier-noun combinations. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 23(1):71-87.

Galtung, J. 1966. A structural theory of integration. *Journal of Peace Research*, 375-396.

Gamayanto, I. 2005. Porter's five forces model; Scott Morton's five forces model; Bakos and Treacy model analyses. [Strategic information systems management]. *Jurnal Informatika*, 5(2):127-134.

Gandal, N., Gantman, N. & Genesove, D. 2007. Intellectual property and standardisation committee participation in the US modem industry. In S. Greenstein & V. Stango (eds.). *Standards and public policy*. New York, NY: Cambridge University Press, 208-230.

Gao, P., Yu, J. & Lyytinen, K. 2014. Government in standardization in the catching-up context: Case of China's mobile system. *Tellecommunications Policy*, 38(2):200-209.

Garcés-Mascareñas, B. & Penninx, R. 2016. *Integration processes and policies in Europe: Context, level and actors.* Rotterdam: IMISCOE Research Series.

Gartner Group. 2010. Gartner EXP worldwide survey of nearly 1,600 CIOs shows IT budgets in 2010 to be at 2005 levels. Newsroom, Press Release.

Garvin, D. 1991. How the Baldridge award really works. *Harvard Business Review*, 69(9):80-93.

Genschel, P. 1997. How fragmentation can improve co-ordination: Setting standards in international telecommunications. *Organization Studies*, 18:603-622.

George, D. & Mallery, P. 2016. *IBM SPSS Statistics 23 step by step: A simple guide and reference*. Fourteenth edition. Retrieved from http://spss-step-by-step.net/SPSS%2023%20Step%20by%20Step%20Answers%20to%20Selected%20Exercises.pdf [Accessed 1 February 2017].

Giannia, M. & Gotzamani, K. 2015. Management systems integration: Lessons from an abandonment case. *Journal of Cleaner Production*, 86:265-276.

Gilbreth, F.B. 1922. Process charts and their place in management. *Mechanical Engineering*, 70:38-41.

Gilson, L.L., Mathieu, J.E., Shalley, C.E. & Ruddy, T.M. 2005. Creativity and standardization: Complementary or conflicting drivers of team effectiveness? *Academy Management Journal*, 48:521-531.

Golafshani, N. 2010. Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4):597-607.

Goldkuhl, G. & Lind, M. 2008. Coordination and transformation in business processes: Towards an integrated view. *Business Process Management Journal*, 14(6):761-77.

Gopalakrishnan, M.S., Chandramohan, P.S. & Maheswari, A. 2015. Integrated management systems for better environmental performance and sustainable development: A review. *Engineering and Management Journal*, 14(5):985-1000.

Griffith, A. & Bhutto, K. 2009. Better environmental performance: A framework for integrated management systems (IMS). *Management of Environmental Quality: An International Journal*, 20:566-580.

Griffith, A. 1999. *Developing an integrated management system for quality, safety and environment.* Construction papers, 108. Ascot: Chartered Institute of Building.

Griffith, A. 2000. Integrated management systems: A single management system solution for project control? *Engineering Construction and Architectural Management*, 7:232-240.

Grimwade, N. 2013. Theory of economic integration. In *The New Palgrave Dictionary of Economics*, Online Edition. http://www.dictionaryofeconomics.com/article?id=pde2013_E000336

Groesser, S.N. 2014. Coevolution of legal and voluntary standards: Development of energy efficiency in Swiss residential building codes. *Technological Forecasting and Social Change*, 87:1-16.

Grotnes, E. 2009. Standardization as open innovation: Two cases from the mobile industry. *Information Technology & People*, 22:367-381.

Guadalupe, M., Li, H. & Wulf, J. 2014. Who lives in the c-suite? Organisational structure and the division of labour in top management. *Management Science*, 60(4):824-844.

Gummesson, E. 2008. Extending the service-dominant logic: From customer centricity to balanced centricity. *Journal of the Academy of Marketing Science*, 36:15-17.

Gunasekaran, A. & Ngai, E.W.T. 2004. Information systems in supply chain integration and management. *European Journal of Operational Research*, 159(2):269-295.

Gurvis, S. 2007. *Management basics: A practical guide for managers.* Second edition. Avon, MA: Adams Media.

Guthrie, J.P. 2001. High-involvement work practices, turnover, and productivity: Evidence from New Zealand. *Academy of Management Journal*, 44(1):180-190.

Guzzo, R.A. & Shea, G.P. 1992. Group performance and intergroup relations in organisations. In M.D. Dunnette & L.M. Hough (eds.). *Handbook of industrial and organisational psychology* (pp. 269-313). Palo Alto CA: Consulting Psychologists Press.

Guzzo, R.A. 1988. Productivity research: Reviewing psychological and economic perspectives. In J.P. Campbell & R.J. Campbell (eds.). *Productivity in organisations: New perspectives from industrial and organisational psychology.* San Francisco, CA: Jossey-Bass, 63-81.

Haas, E.B. 1975. Turbulent fields and the theory of regional integration. *International Organization*, 27(1):174-212.

Hadfield, W. 2007. BP to save 600 million pounds in global IT process standardisation. *Computer Weekly*, May: 5.

Hair, J.F., Anderson, R.E., Tatham, R.L. & Black, W.C. 1995. *Multivariate data analysis*. Fourth edition. Upper Saddle River, NY: Prentice Hall.

Hambrick, D.C. 1981. Strategic awareness within top management teams. *Strategic Management Journal*, 2:263-279.

Hambrick, D.C. 1983. Some tests of the effectiveness and functional attributes of Miles and Snow's strategic types. *Academy of Management Journal*, 26:5-26.

Hamel, G. & Prahalad, C.K. 1985. Do you really have a global strategy? *Harvard Business Review*, July-August: 139-148.

Hammer, M. & Stanton, S. 1999. How process organisation really work. *Harvard Business Review*, 77(6):108-120.

Handelman, D. 1976. Bureaucratic transactions: The development of official-client relationships in Israel. In B. Kapferer (ed.). *Transaction and meaning: Directions in the anthropology of exchange and symbolic behaviour*. Philadelphia, PA: Institute for the Research of Human Issues, 223-275.

Hanseth, O., Monteiro, E. & Hatling, M. 1996. Developing information infrastructure: The tension between standardization and flexibility. *Science, Technology and Human Values*, 21(4):407-426.

Harel, G.H. & Tzafrir, S.S. 1999. The effect of human resource management practices on the perceptions of organisational and market performance of the firm. *Human Resource Management*, 38(3):185-199.

Hatto, P. 2010. *Standards and standardization handbook*. Brussels: European Commission.

Heckman, J.J. 2006. Skill formation and the economics of investing in disadvantaged children. *American Association for the Advancement of Science*, 312(5782):1900-1902.

Heider, F. 1958. *The psychology of interpersonal relations.* New York, NY: Wiley.

Heras-Saizarbitoria, I. & Boiral, O. 2013. ISO 9001 and ISO 14001: Towards a research agenda on management system standards. *International Journal of Management Reviews,* 15(1):47-65. doi: 10.1111/j.1468-2370.2012.00334.x

Heras-Saizarbitoria, I. 2011. Internalization of ISO 9000: An exploratory study. *Industrial Management and Data Systems*, 111(8):1214-1237. doi: 10.1108/ 02635571111170776

Heras, I. & Casadesus, M. 2006. ISO 9001 and residual homes for the elderly: “a Delphi study”. *Managing Service Quality*, 18(3):272-88.

Hersey, P. & Blanchard, K.H. 1969. Life cycle theory of leadership. *Training and development Journal*, 23(5):26-34.

Herzberg, F. 1966. *Work and the nature of man*. New York, NY: World Publishing Company.

Hill, C.W.L. & Jones, G.R. 2012. *Strategic management: An integrated approach.* Tenth edition. Mason, OH: South-Western College.

Hill, C.W.L. 1988. Differentiation versus low cost or differentiation and low cost: A contingency framework. *Academy of Management Review*, 13:401-412.

Hines, F. 2002. *Integrated management systems: Inclusivity of approach of dilution of problems?* Poster presentation at the 10th International Conference of the Greening of Industry Network, Sweden.

Hitt, M.A., Ireland, R.D. & Hoskisson, R.E. 2014. *Strategic management: Competitiveness and globalization – Concepts and cases* (11th edition). Mason, OH: South-Western College.

Hix, S. 1998. The study of the European Union II: The 'new governance' agenda and its rival. *Journal of European Public Policy*, 5(1):38-65.

Ho, J.-Y. & O'Sullivan, E. 2014. *Defining and categorising 'standards' in innovation*. Working paper. Centre for Science Technology and Innovation Policy, University of Cambridge.

Hofstee, E. 2006. *Constructing a good dissertation: A practical guide to finishing a master's, MBA or PhD on schedule*. Johannesburg: EPE.

Horn, J. & Wilburn, D. 2005. The embodiment of learning. *Educational Philosophy and Theory*, 37(5):745-760.

Horn, J. 2008. Human research and complexity theory. *Educational Philosophy and Theory*, 40(1).

House, R.J. 1971. A path goal theory of leader effectiveness. *Administrative Science Quarterly*, 16(3):321-339.

Hoyle, D. 1999. *ISO 9000 quality systems handbook*. Oxford: Elsevier Butterworth-Heinemann.

Hoyle, D. 2005. *ISO 9000 quality systems handbook*. Fifth edition. Oxford: Elsevier Butterworth-Heinemann.

Huber, A.J. 2011. Effective strategy implementation: Conceptualizing firms' strategy implementation capabilities and assessing their impact on firms performance. Unpublished PhD thesis. Bern: University of Bern.

Huczynski, A.A. 1996. *Management gurus: What makes them and how to become one*. London: International Thomson Business Press.

Huddleston, T. & Tjaden, J.D. 2012. *Immigrant Citizens Survey*. Brussels: King Baudouin Foundation and Migration Policy Group.

Hussey, J. & Hussey, R. 1997. *Business research: A practical guide for undergraduate and postgraduate students.* Basingstoke: Macmillan.

Hutton, W. 2002. *The world we're in*. London: Little, Brown.

Huy, Q.N. 2011. How middle managers group focus emotions and social identities influence strategy implementation. *Strategic Management Journal*, 32:1387-1410.

Hypolito, C. & Pamplona, E. 1999. Systems integration, *Journal of production*, 32:453-465.

Hytönen, H., Jarimo, T., Salo, A. & Yli-Juuti, E. 2013. Markets for standardized technologies: Patent licensing with principle of proportionality. *Technovation*, 32:523-535.

Iansiti, M. 1997. *Technology integration: Making critical choices in a dynamic world*. Boston, MA: Harvard Business School Press.

IBM. 2010. *Report to shareholders*. Retrieved from 2011.www.ibm.com/ibm/sjp/04_27_2010.html

Idris, S., Wahab, R. & Jaapar, A. 2015. Corporate cultures integration and organisational performance: A conceptual model on the performance of acquiring organisations. *Procedia - Social and Behavioral Sciences*, 172:591-595. doi: 10.1016/j.sbspro.2015.01.407

Ilievski, N,L. 2015. The concept of political integration: The perspectives of neofunctionalist theory. *Journal of Liberty and International Affairs*, 1(1):1-14.

International Organization for Standardization (ISO). 2004. *Quality management system. Requirements*. Geneva.

International Organization for Standardization (ISO). 2008. *ISO 9001:2008 quality management systems: Requirements*. Geneva.

International Organization for Standardization (ISO). 2009. *New edition of ISO 9004 maps out the path forward to 'sustained success'*. Retrieved from www.iso.org/iso/news.htm?refid¼Ref1263 [Accessed 16 July 2013].

International Organization for Standardization (ISO). 2010. *ISO 9004:2009: Managing for the sustained success of an organization: A quality management approach*. Geneva.

International Organization for Standardization (ISO). 2011. *ISO 9001:2000 – what does it mean in the supply chain?* Retrieved from www.iso.org/ iso/home/news_index/news_archive/news.htm?refid¼Ref954 [Accessed 16 July 2013].

International Organization for Standardization (ISO). 2012. *The ISO Survey of Certifications – 2011.* Geneva.

International Organization for Standardization (ISO). 2015. *The ISO Survey of Certifications*. Geneva.

ISO/IEC (International Organisation for Standardization / International Electrotechnical Commission). 1996. *Standardization and related activities: General vocabulary*. Guide 2. Seventh edition. Geneva.

ISO/IEC (International Organisation for Standardization / International Electrotechnical Commission). 2004. *Standardization and related activities: General vocabulary*. Guide 2. Geneva.

Jackson, M.C. 2003. *Systems thinking: Creative holism for managers*. Chichester: Wiley.

Jackson, S.L. 1997. *The ISO 14001 implementation guide: Creating an integrated management system*. New York, NY: Wiley.

Jain, S. 1989. Standardisation of international marketing strategy: Some research hypotheses. *Journal of Marketing*, 53(1):70-79.

Jakobs, K., Procter, R. & Williams, R. 2001. Standardisation, innovation and implementation of information technology. *Computers and Networks in the Age of Globalization*, 57:201-217.

Jayaram, J. & Vickery, S.K. 1998. Supply-based strategies, human resource initiatives, procurement leadtime, and firm performance. *The Journal of Supply Chain Management*, 34(1):12-24.

Jayaram, J., Vickery, S.K. & Droge, C. 2000. The effects of information systems infrastructure and process improvements on supply-chain time performance. *International Journal of Physical Distribution & Logistics Management*, 30(3):314-30.

Jemala, M. 2012. Integration of technology management and its development technology implementation and commercialisation. Unpublished thesis. School of Engineering and Management, University of Nova Gorica, Slovenia.

Jones, T.M. 1995. Instrumental stakeholder theory: A synthesis of ethics and economics. *Academy of Management Review*, 20(2):404-437.

Jorgensen, T.H. & Remmen, A. 2005. Environmental management systems. In L. Kørnøv, M. Thrane, A. Remmen & H. Lund (eds.). *Tools for sustainable development*. Preliminary edition. Aalborg: Aalborg University.

Jorgensen, T.H. 2008. Towards more sustainable management systems: Through life cycle management and integration. *Journal of Cleaner Production,* 16(10):1071-1080.

Jorgensen, T.H., Remmen, A. & Mellado, M.D. 2006. Integrated management systems: Three different levels of integration. *Journal of Cleaner Production*, 14(8):713-722.

Juran, J. 1988. Managing for quality. *The Journal for Quality and Participation*, 11(1):8-12.

Kano, S. 2000. Technical innovations, standardization and regional comparison: A case research in mobile communications. *Telecommunications Policy*, 24:305-321.

Kapur, S. 1992. *Raising up a prophet: The African-American encounter with Gandhi*. Boston, MA: Beacon Press.

Karapetrovic, S. & Casadesus, M. 2009. Implementing environmental with other standardized management systems: Scope, sequence, time and integration. *Journal of Cleaner Production*, 17:533-540.

Karapetrovic, S. & Jonker, J. 2003. Integration of standardized management systems: Searching for a recipe and ingredients. *Total Quality Management & Business Excellence*, 14(4):451-459.

Karapetrovic, S. & Willborn, W. 1998a. Integration of quality and environmental management systems. *TQM Magazine*., 10(3):204-213.

Karapetrovic, S. & Willborn, W. 1998b. The system's view for clarification of quality vocabulary. *International Journal of Quality Reliability Management*, 15(1):99-120.

Karapetrovic, S. & Willborn, W. 2010. Integration of quality and environmental systems. *The TQM Magazine,* 10(3):204-213. –

Karapetrovic, S. 2002. Strategies for the integration of management system and standards. *The TQM Magazine*, 14(1):61-67.

Karapetrovic, S. 2008. Integrative augmentation of standardized systems. Paper presented at the 12th ICIT Conference, Taiwan.

Karapetrovic, S., Casadesús, M. & Heras, I. 2006. *Dynamics and integration of standardized management systems: An empirical study*. Documenta Universitaria. GITASP 1, Girona, Spain.

Karimi, J., Somers, T.M. & Bhattacherjee, A. 2007. The impact of ERP implementation on business process outcomes: A factor-based study. *Journal of Management Information Systems*, 24(1):101-134.

Kettinger, W.J. & Teng, J.T.C. 1997. Business process change: A study of methodologies, techniques, and tools. *Management Information Systems Quarterly*, 21(1):55-80.

Kettinger, W.J., Teng, J.T. & Guha, S. 1997. Business process change: A study of methodologies, techniques, and tools. *MIS Quarterly*, 21(1):55-98.

Khan, A. 1997. Post-migration investment in education by immigrants in the United States. *Quarterly Review of Economics and Finance*, 37:285-313.

Kim, D., Kumar, V. & Kumar, U. 2013. Relationship between quality management practices and innovation. *Journal of Operation Management*, 30(4):295-315.

Korac, M. 2003a. Integration and how we facilitate it: A comparative research of the settlement experiences of refugees in Italy and the Netherlands. *Sociology*, 37:51-68.

Korac, M. 2003b. The lack of integration policy and experiences of settlement: A case study of refugees in Rome. *Journal of Refugee Studies*, 16(4):398-421.

Kotler, P. & Armstong, G. 2006. *Principles of marketing* (11th edition). NJ: Pearson Education.

Kraus, J. & Grosskopf, J. 2008. Auditing integrated management systems: Considerations and practice tips. *Environmental Quality Management*, 18(2):7-16.

Kriesberg, L. 1997. Social movements and global transformation. In J. Smith, C. Chatfield & R. Pagnucco (eds.). *Transnational social movements and world politics: Solidarity beyond the state*. New York, NY: Syracuse University Press, 3-18.

Krugman, P. 1979. Increasing returns, monopolistic competition and international trade. *Journal of International Economics*, 9:469-479.

Krugman, P. 1991. *Geography and trade.* Cambridge, MA: The MIT Press.

Krugman, P.R. & Venables, A.J. 1995. Globalisation and the inequality of nations. *Quarterly Journal of Economics*, 110(4):857-880.

Kubickova, L., Toulova, M., Tuzova, M. & Vesela, L. 2016. The internationalisation motives of SMEs from the Czech Republic in the context of EU accession. *Society and Economy*, 38(3):375-386.

Kuei, C. & Lu, M.H. 2013. Integrating quality management principles into sustainability management. *Total Quality Management and Business Excellence*, 24(1/2):62-78.

Kurtz, H.D. 2012. Schumpeter's new combinations: Revisiting his Theorie der wirtschaftlichen Entwicklung on the occasion of its centenary. *Journal of Evolutionary Economics*, 22:871-899.

Lampland, M. & Star, S.L. (Eds.). 2009. *Standards and their stories: How quantifying, classifying, and formalizing practices shape everyday life*. Ithaca, NY: Cornell University Press.

Lazarus, M.D., Kauffman, G.L. Jr, Kothari, M.J., Mosher, T.J., Silvis, M.L., Wawrzyniak, J.R., Anderson, D.T. & Black, K.P. 2014. Anatomy integration blueprint: A fourth-year musculoskeletal anatomy elective model. Anatomical Science Education.

Lee, J.-N. & Kim, Y.-G. 1997. Information systems outsourcing strategies for affiliated forms of the Korean conglomerate groups. *Journal of Strategic Information Systems*, 6(3):203-229.

Lee, T.H., Shiba, S. & Wood, R.C. 1999. *Integrated management systems: A practical approach to transforming organisations*. New York: Wiley.

Leiponen, A.E. 2008. Competing through cooperation: The organization of standard setting in wireless telecommunications. *Management Sci*ence, 54:1904-1919.

Leonardi, M.P. 2008. Indeterminacy and the discourse of inevitability in International technology management: *Academy of Management Review*, 33(4):975-984.

Leshem, S. & Trafford, V. 2007. Overlooking the conceptual framework. *Innovations in Education and Teaching International*, 44(1):93-105.

Levitt, T. 1983. Globalizations of markets. *Harvard Business Review*, 61(3):69-81.

Lavingne, M. The Economics of Transition: From Socialist Economy to Market Economy. London: Macmillan Press, 1995.

Lewin, K. 1951. *Field theory in social science*. London: Tavistock.

Likert, R. 1961. *New patterns of management*. New York, NY: McGraw-Hill.

Likert, R. 1967. *The human organisation: Its management and value*. New York, NY: McGraw-Hill.

Lillrank, P. & Liukko, M. 2004. Standard, routine and non-routine processes in health care. *International Journal of Health Care Quality Assurance*, 17(1):39-46.

Lillrank, P. 2003. The quality of standard, routine and nonroutine processes. *Organization Studies*, 24(2):215-233.

Lim, C., Han, S. & Ito, H. 2013. Capability building through innovation for unserved lower end megamarkets. *Technovation*, 33(12):391-404.

Lindberg, N.L. 1963. *The political dynamics of European integration*. Stanford, CA: Stanford University Press.

Lippman, S. & Rumelt, R. 1982. Uncertain imitability: An analysis of interfirm differences in efficiency under competition. *Bell Journal of Economics*, 13:418-438.

Lockwood, D. 1964. Social integration and system integration. In G.K. Zollschan & H.W. Hirsch (eds.). *Explorations in social change*. Boston, MA: Houghton Mifflin.

Lonergan, B. 1958. *Insight: A study of human understanding.* New York, NY: Philosophical Library.

Lopez-Berzosa, D. & Gawer, A. 2014. Innovation policy within private collectives: Evidence on 3GPP's regulation mechanisms to facilitate collective innovation. *Technovation*, 34:734-745.

Lopez-Fresno, P. 2010. Implementation of an integrated management system in an airline: A case study. *TQM J*, 22(6):629-647.

Luftman, J. & Zadeh, H.S. 2011. Key information technology and management issues 2010-11: An international study. *Journal of Information Technology*, 26:193-204.

Lunenburg, F.C. & Omstein, A.C. 1991. *Educational administration: Concepts and practices*. Belmont, CA: Wadsworth.

Lupton, T. 1976. Best fit in the design of organisations. In E.J. Miller (ed.). *Task and organisation*. New York, NY: Wiley.

Mackau, D. 2003. SME integrated management system: A proposed experiences model. *The TQM Magazine*, 15(1):43-51.

Madhani, P.M. 2011. Value creation through cross-functional collaboration: Making a case for SCM and marketing integration. *Dharohar International Management Journal*, 1(1):36-48.

Madyo, R.M. 2008. The importance of regional economic integration in Africa. Unpublished MComm thesis. Pretoria: University of South Africa.

Maiera, D., Vadastreanu, A.M., Kepplerc, T., Eidenmullerd, T. & Maiere, A. 2015. Innovation as a part of an existing integrated management system. In C. Bektas et al. (ed.) *4th World Conference on Business, Economics and Management*. Kusadasi: Procedia Economics and Finance Volume 26.

Mail & Guardian. 2017. statistics. Retrieved from www.mail and guardian.co.za [Accessed 16 August 2017].

Manders, B., De Vries, H.J. & Blind, K. 2016. ISO 9001 and product innovation: A literature review and research framework. *Technovation*, 48-49.

Maney, G.M. 2002. Transnational structures and protest: Linking theories and assessing evidence. In J. Smith & H. Johnston (eds.). *Globalization and resistance: Transnational dimensions of social movements*. Lanham, MD: Rowman & Littlefield, 31-50.

Mani, D., Barua, A. & Whinston, A.B. 2010. An empirical analysis of the impact of information capabilities design on business process outsourcing performance. *Management Information Systems Quarterly*, 34(1):39-62.

Manrodt, K.B. & Vitasek, K. 2004. Global process standardization: A case study. *Journal of Business Logistics*, 25(1)1-23.

Manson, S.M. 2001. Simplifying complexity: A review of complexity theory. *Geoforum*, 32:405-414.

Manu, F.A. & Sriram, V. 1996. Innovation, marketing strategy, environment, and performance. *Journal of Business Research*, 35(1):79-91.

March, J.G. 1991. Exploration and exploitation in organisational learning. *Organization Science*, 2:71-87.

Markus, M.L., Tanis, C. & Van Fenema, P.C. 2000. Organisation resource planning: Multisite ERP implementations. *Communications of the ACM*, 43(4):42-46.

Marska, M. & Sladek, P. 2017. Management of business informatics and performance management. *Journal of System Integration*, (1):13-21.

Martins, D.M., Faria, A.C., Prearo, L.C. & Arruda, A.G.S. 2016. The level of influence of trust, commitment, cooperation, and power in the interorganisational relationships of Brazilian credit cooperatives. *RAUSP Management Journal*, 52:47-58.

Maryska, M. & Sladek, P. 2017. Management of business informatics and performance management. *Journal of System Integration,* 1:13-21. doi: 10.20470/jsi.v8i1.284

Maslow, A.H. 1943. A theory of human motivation. *Psychological Review*, 50(4):370-396.

Maslow, A.H. 1970. *Motivation and personality*. New York, NY: Harper and Row.

Matias, J.C.D.O. & Coelho, D.A. 2002. The integration of the standards systems of quality management, environmental management and occupational health and safety management. *International Journal of Production Research*, 40(15):3857-3866.

Matsumoto, D. 2001. Culture and emotion. In D. Matsumoto (ed.). *The handbook of culture and psychology*. New York, NY: Oxford University Press, 171-194.

Maxwell, J.A. 1996. *Qualitative research design: An interactive approach.* Thousand Oaks, CA: Sage.

Mayo, E. 1923. Irrationality and revery. *Journal of Personnel Research*, 1(11):477-483.

Mayo, E. 1930. The human effect of mechanization. *The American Economic Review*, 20(1):156-176.

Mayo, E. 1933. *The human problems of an industrial civilization*. New York, NY: Macmillan.

McAdam, D. & Rucht, D. 1993. The cross-national diffusion of movement ideas. *The Annals of the American Academy of Political and Social Science*, 528:56-74.

McCarthy, I.P. & Gordon, B.R. 2011. Achieving contextual ambidexterity in R&D organizations: A management control system approach. *R&D Management*, 41(3):240-258.

McCarthy, I.P., Tsinopoulos, C., Allen, P. & Anderssen, C.R. 2006. New product development as a complex adaptive system of decisions. *Journal of Product Innovation Management*, 23:437-456.

McDermott, C.M. & Stock, G.N. 1999. Organizational culture and advanced manufacturing technology implementation. *Journal of Operations Management*, 17(5):521-533.

McDonald, M., Mors, T.A. & Phillips, A. 2003. Management system integration: Can it be done? *Quality Progress*, October: 67-74.

Melnikas, B. 2008. Integration processes in the Baltic Region: The new form of regional transformations in the European Union. *Engineering Economics*, 5(60):54-64.

Melville, N. & Ramirez, R. 2008. Information technology innovation diffusion: An information requirements paradigm. *Information Systems Journal*, 18(3):247-273.

Metcalfe, J.S. & Miles, I. 1994. Standards, selection and variety: An evolutionary approach. *Information Economics and Policy*, 6(3):243-268.

Metri, B.A. 2005. TQM critical success factors for construction firms. *Management*, 10(2):61-72.

Miles, G., Snow, C.C. & Sharfman, P. 1993. Industry variety and performance. *Strategic Management Journal*, 14:163-177.

Miles, R.E. & Snow, C.C. 1978. Organisational strategy, structure, and process. New York, NY: McGraw-Hill.

Miles, R.E. & Snow, C.C. 1986. Organisations: New concepts for new forms. *California Management Review*, 18(3):62-73.

Mintzberg, H. 1973. *The nature of managerial work*. New York, NY: Harper & Row.

Mitchell, R.K., Agle, B.R. & Wood, D.J. 1997. Towards a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review*, 22(4):853-886.

Moravcsik, A. 1993. Armaments among allies: Franco-German weapons cooperation, 1975-1985. In P. Evans, H. Jacobson & R. Putnam (eds.). *Double-edged diplomacy: International bargaining and domestic politics*. Berkeley, CA: University of California Press, 128-168.

Morton, M.S.S. (Ed.). 1991. *The corporation of the 1990s: Information technology and organizational transformation*. New York, NY: Oxford University Press.

Muenstermann, B. & Eckhardt, A. 2009. What drives business process standardization? A case research approach. In *Proceedings of the International Conference on Information Resources Management (Conf-IRM 2009)*, Dubai.

Muenstermann, B. & Weitzel, T. 2008. What are process standards? In *Proceedings of the 2008 International Conference on Information Resources Management (Conf-IRM 2008)*, Niagara Falls, Ontario.

Muenstermann, B., Eckhardt, A. & Weitzel, T. 2009a. Join the standard forces: Examining the combined impact of process and data standards on business process performance. In *Proceedings of the 42nd Hawaiian International Conference on System Sciences (HICSS-42)*, Hilton Waikoloa Village, Big Island, HI.

Muenstermann, B., Eckhardt, A. & Weitzel, T. 2009b. The performance impact of business process standardization: An empirical evaluation. *Business Process Management Journal*, 16(1):29-56.

Muenstermann, B., Eckhardt, A. & Weitzel, T. 2010. The performance impact of business process standardization. *Business Process Management Journal*, 16(1):29-56.

Nam, T. & Pardo, T.A. 2014. Understanding municipal service integration: An exploratory study of 311 contact centers. *Journal of Urban Technology*, 21(1):55-76. doi: 10.1080/10630732.2014.887933

Narahari, S.R., Ryan, T.J., Bose, K.S., Prasanna, K.S. & Aggithaya, G.M. 2011. Integrating modern dermatology and Ayurveda in the treatment of vitiligo and lymphedema in India. *International Journal of Dermatology*, 50:310-334.

Narayanana, V.K. & Chen, T. 2012. Research on technology standards: Accomplishment and challenges. *Research* Policy, 41:1375-1406.

Nasir, A. & Altinbasak, I. 2009. Standardization vs. adaptation. *Strategic Management Review*, 3(1):17-50.

Neuman, W.L. 2000. *Social research methods: Qualitative and quantitative approaches*. Fourth edition. Boston, MA: Allyn & Bacon.

Ng, P.T. & Ang, H.S. 2011. Integrating quality and innovation: The case of the Singapore Police Force. *International Journal of Quality and Innovation*, 1:237-251.

Noble, M.T. 2000. *Organisational mastery with integrated management systems: Controlling the dragon*. London: Wiley.

Nosková, M. 2012. *Application of the project management in organisation architecture*. University of Economics. Retrieved from http://www.vse.cz/vskp/33496_aplikace_projektoveho_rizeniv% C2%-Organisation

Novotný, M. 2006. *Organisation architecture IT*. System ONLINE. Retrieved from http://www.systemonline.cz/sprava-it/organisation-architektura-it.htm

Novotný, T.E. 2006. US Department of Health and Human Services: A need for global health leadership in preparedness and health diplomacy. *American Journal of Public Health*, 96(1):11-13.

NPC (National Planning Commission) - 2030. *National Development Plan. Our future – make it work.* Republic of South Africa: Sherino Printers.

NSTC (National Science and Technology Council). 2011. *National Nanotechnology Initiative: Strategic plan*. Washington, DC: Executive Office of the President of the United States.

Ogilvy, J. 2013. System theory, arrogant and humble. *World Futures*, 69(4-6):332-344.

Olaru, M., Maier, D., Nicoara, D. & Maier, A. 2014. Establishing the basis for development of an organisation by adopting the integrated management systems: Comparative research of various models and concepts of integration. *Procedia - Social and Behavioral Sciences*, 109:693-697.

Oskarsson, K. & Malmborg, F.V. 2005. Integrated management systems as a corporate response to sustainable development. *Corporate Social Responsibility and Environmental Management*, 12(3):121-128.

Ott, J.S. 1989. *The organisational culture perspective*. Chicago, IL: The Dorsey Press.

Palm, K., Lilja, J. & Wiklund, H. 2016. The challenge of integrating innovation and quality management practice. *Total Quality Management & Business Excellence*, 27(1/2):34-47.

Parnell, J.A. & Hershey, L. 2005. The strategy performance relationship revisited: The blessing and curse of the combination theory. *International Journal of Commerce and Management*, 15(1):17-33.

Parnell, J.A. & Wright, P. 1993. Generic strategy and performance: An empirical test of the Miles and Snow typology. *British Journal of Management*, 4:29-36.

Parsons, T. 1951. *The social system*. New York, NY: The Free Press.

Patience, M.M.A. 2008. Integrated management systems − A qualitative research of the levels of integration of three Danish companies. Unpublished MSc thesis. Aalborg: Aarlborg University.

Peng, X., Liu, Y. & Lin, Y. 2015. The impact of environment uncertainty and effectual flexibility on entrepreneurial resource combination: The moderating effect of entrepreneurial self-efficacy. *Frontiers of Business Research in China*, 9(4):559-575.

Peng, X.B., Chen, L.L. & Liu, Y.I. 2015. Study on relationship among entrepreneurship resources integration, organisational coordination and new venture performance. *Science Research Management*, Article in Press.

Pentland, B.T. 2003. Sequential variety in work processes. *Organization Science*, 14(5):528-540.

Perera, H.S.C., Nagarur, N. & Tabucanon, M.T. 1999. Component part standardization: A way to reduce the life-cycle costs of products. *International Journal of Production Economics*, 60(1):109-116.

Perlman, Y. 2013. Casual relationships in the balance scorecard: A path analysis approach. *Journal of Management and Strategy*, 4(1):70-79.

Peslak, A. 2011. A study of information technology integration. *Journal of Information Systems Applied Research*, 4(2):19-27.

Peteraf, M.A. 1993. The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14(3):179-191.

Peters-Berries, C. 2010. *Regional integration in southern Africa: A guidebook*. Germany: International Institute for Journalism.

Pienaar, C. 2009. The role of self-deception in leadership ineffectiveness: A theoretical overview. *South African Journal of Psychology*, 39(1):133-140.

Porter, M.E. 1979. How competitive forces shape strategy. *Harvard Business Review*, 57(2):137-145.

Porter, M.E. 1980. *Competitive strategy*. New York, NY: Free Press.

Porter, M.E. 1981. The contributions of industrial organisation to strategic management. *Academy of Management Review*, 6:609-620.

Porter, M.E. 2001. Strategy and the Internet. *Harvard Business Review*, 79(3):73-78. Press.

Pryor, M.G., Humphreys, J.H., Oyler, J., Taneja, S. & Toombs, L.A. 2011. The legitimacy and efficacy of current organisational theory: An analysis. *International Journal of Management*, 28(4):209-228.

Punch, K.F. 2000. *Developing effective research proposals*. London: Sage.

PwC. 2009. *Information technology: How to complete the M&A integration process, minimize disruptions, and achieve desired synergies*. London.

Quelch, J.A. & Hoff, E.J. 1986. Customizing global marketing. *Harvard Business Review*, 64, May/June: 59-68.

Quinn, R.E. & Spreitzer, G.M. 1991. The psychometrics of the competing values culture instrument and an analysis of the impact of organizational culture on quality of life. In R.W. Woodman & W.A. Pasmore (eds.). *Research in organizational change and development*, Vol. 5. Greenwich, CT: JAI Press, 115-142.

Rad, A.M.M. 2006. The impact of organisational culture on the successful implementation of total quality management. *The TQM Magazine*, 18(6):606-625.

Rahimi, F., Moller, C. & Hvam, L. 2016. Succeeding in process standardization: Explaining the fit with international management strategy. *Business Process Management Journal*, 22(6):1212-1246.

Raj, P. 2011. Enriching the 'integration as a service' paradigm for the cloud era. In R. Buyya, J. Broberg & A. Goscinski (eds.). *Cloud computing principles and paradigms*. Hoboken, NJ: Wiley, 57-96.

Ramakumar, A. & Cooper, B. 2004. Process standardization proves profitable. *Quality*, 43(2):42-45.

Ramphal, R. 2012. *Integrated SHEQ management based on ISO OHSAS standard*. Study guide. Pretoria: Unisa.

Rasmussen, J. & Jorgensen, T. 2007. *Integrated management systems: An analysis of best practice in Danish companies.* Aalborg: Aalborg University.

Rau, P.A. & Preble, J.F. 1987. Standardization of marketing strategy by multinationals. *International Marketing Review*, 4(3):18-28.

Rebelo, F.M., Santos, G. & Silva, R. 2014. A generic model for integration of quality, environment and safety management systems. *The TQM Journal*, 26(2):143-159.

Rebelo, M.F., Santos, G. & Silva, R. 2014. A methodology to develop the integration of the environmental management system with other standardized management systems. *Computational Water, Energy, and Environmental Engineering*, 3:170-181.

Refugee Council. 1997. *An agenda for action: Challenges for refugee settlement in the UK*. London.

Reijers, H. & Liman Mansar, S. 2005. Best practices in business process redesign: An overview and successful redesign heuristics. *Omega International Journal of Management Science*, 33(4):283-306.

Renzi, M.F. & Cappelli, L. 2000. Integration between ISO 9000 and ISO 14000: Opportunities and limitations. *Total Quality Management*, 11(4-6):849-856.

Reves, E. 2006. *The anatomy of peace*. New York: Harper & Brothers Publishers.

Richardson, K. (Ed.). 2005. *Managing the complexity: Philosophy, theory and application.* Greenwich, CT: Information Age.

Richie, J. & Lewis, J. 2003. *Qualitative research practice: A guide for social students and researchers*. London: Sage.

Rietveld, T. & Van Hout, R. 1993. *Statistical techniques for the research of language and language behaviour*. Berlin: Mouton de Gruyter.

Rietz, J. 2002. Host societies and the reception of immigrants: Research themes, emerging theories and methodological issues. *The International Migration Review*, 36(4):1005-1019.

Roberts, R.M. & Handline, H.M. 1975. Maximising executive effectiveness: Deciding about what to decide. *Management Review,* 25-32.

Robinson, V. 1998. Defining and measuring successful refugee integration. In *Proceedings of ECRE International Conference on Integration of Refugees in Europe*, Antwerp. Brussels: ECRE.

Robson, C. 1993. *Real world research.* Oxford: Blackwell.

Robson, C. 2002. *Real world research*. Second edition. Oxford: Blackwell.

Rocha, M., Searcy, C. & Karapetrovic, S. 2007. Integrating sustainable development into existing management systems. *Total Quality Management and Business Excell*ence, 18(1):83-92.

Roettilisberger, F.J. & Dickson, W.Z. 1939. *Management and the worker*. Cambridge, MA: Harvard University Press.

Rogers, E.M. 2003. *Diffusion of innovations*. Fifth edition. New York, NY: The Free Press.

Rosamond, B. 1995. *Theories of European integration.* New York, NY: Macmillan.

Rosenhead, J. 1998. *Complexity theory and management practice*. Operational Research working papers. Retrieved from http://human-nature.com/scienceas-culture/rosenhead.html

Ross, J.W. 2003. Creating a strategic IT architecture competency: Learning in stages. *MIS Quarterly Executive*, 2(1):31-43.

Ross, J.W., Weill, P. & Robertson, D.C. 2006. *Organisation architecture as strategy*. Boston, MA: Harvard Business School Publishing.

Roth, K. 1995. Managing international interdependence: CEO characteristics. *Academy of Management Journal*, 38(1):200-231.

Roth, K., Schweiger, D.M. & Morrison, A.J. 1991. Global strategy implementation at the business unit level: Operational capabilities and administrative mechanisms. *Journal of International Business Studies*, 22(3):369-402.

Rothman, F.D. & Oliver, P.E. 2002. From local to global: The anti-dam movement in southern Brazil 1979-1992. In J. Smith & H. Johnston (eds.). *Globalization and resistance: Transnational dimensions of social movements*. Lanham, MD: Rowman & Littlefield.

Rydhagen, B. & Dackman, C. 2011. Integration of sustainable development in sanitary engineering education in Sweden. *European Journal of Engineering Education*, 36(1):87-95.

Rysman, M. & Simcoe, T. 2008. Patents and the performance of voluntary standard-setting organizations. *Management.Sci*ence, 54:1920-1934.

Sacristan, J.A. 2015. Clinical research and medical care: Towards effective and complete integration. *BMC Medical Research Methodology*, 15(4):1-7.

Sadegzadeh, A., Hasanzadeh, M. & Najafgholinezhad, A. 2013. *Information and information flow in organisation*. Tehran: Ketabdar.

Sajfert, Z., Đordjević, D. & Bešić, C. 2006. *Menadžment trendovi.* Zrenjanin: Tehnĭcki Fakultet Mihajlo Pupin.

Salkind, N.J. 2009. *Exploring research* (7th edition). Upper Saddle River, NJ.: Pearson International.

Salomone, R. 2008. Integrated management systems: Experiences in Italian organizations. *Journal of Cleaner Production*, 16:1786-1806.

Saltzman, J., Chatterjee, S. & Raman, M. 2008. A framework or ICT standards creation: The case of ITU-T standard H.350. *Information Systems*, 33:285-299.

Sampaio, P., Saraiva, P. & Domingues, P. 2012. Management systems: Integration or addition? *International Journal of Quality and Reliability Management*, 29(4):402-424.

Sampaio, P., Saraiva, P. & Rodrigues, A. 2008. Sistemas de gestão: Da qualidade para outros sistemas. International Symposium on Occupational Safety and Hygiene, Guimarães.

Samy, G.M., Samy, C.P. & Ammasaippan, M. 2015. Integrated management systems for better environmental performance and sustainable development: A review. *Environmental Engineering and Management Journal*, 14(5):985-1000.

Sanchez-Rodrıguez, C., Hemsworth, D., Martínez-Lorente, Á.R. & Clavel, J.G. 2006. An empirical study on the impact of standardization of materials and purchasing procedures on purchasing and business performance. *Supply Chain Management: An International Journal*, 11(1):56-64.

Santos, E.M.M., Edwards, Q.T., Santos, M.F., Rogatto, R.S., Achatz, M.I.W. & MacDonald, D.J. 2013. Integration of genomics in cancer care. *Journal of Nursing Scholarship*, 45(1):43-51.

Santos, G., Mendes, F. & Barbosa, J. 2011. Certification and integration of management systems: The experience of Portuguese small and medium enterprises. *Journal of Cleaner Production*, 19(17-18):1965-1974. doi: 10.1016/j.jclepro.2011.06.017

Sarrafizadeh, A. 2011. *Management information systems*. Tehran: Termeh.

Saunders, M., Lewis, P. & Thornhill, A. 2012. *Research methods for business students*. Sixth edition. Harlow: Prentice Hall.

Schäfermeyer, K.M., Rosenkranz, C. & Holten, R. 2012. The impact of business process complexity on business process standardization. *Business & Information Systems Engineering*, 4(5):261-270.

Schierenbeck, I. 2003. *Bakom Valfardsstatens Dorrar*. Umea: Borea.

Schiffman, G.L. & Kanuk, L.L. 2007. *Consumer behaviour* (9th edition). Upper Saddle River, NJ: Prentice Hall.

Schumacker, R.E. & Lomax, R.G. 2004. *A beginner's guide to structural equation modelling.* (2nd edition). Mahwah, NJ: Lawrence Erlbaum.

Schumpeter, J. 1934. *The theory of economic development*. Cambridge, MA: Harvard University Press.

Schumpeter, J.A. 1942. *Capitalism, socialism, and democracy*. New York, NY: Harper and Brothers.

Schweiger, D.M. & Goulet, P.M. 2000. Integrating mergers and acquisitions: An international research review. In C. Cooper & A. Gregory (eds.). *Advances in mergers and acquisitions*. Greenwich, CT: JAI Press, 61-92.

Scott, D. & Darlington, Y. 2002. *Qualitative research in practice: Stories from the field*. St Leonards, Australia: Allyn & Unwin.

Scott, W.G. & Mitchell, T.R. 1972. *Organisational theory: A structural and behavioral analysis*. Homewood, IL: Richard D. Irwin and Dorsey Press.

Scott, W.R. 1995. *Institutions and organisations*. Thousand Oaks, CA: Sage.

Scott, W.R. 2003. Institutional theory. In G. Ritzer (ed.). *Encyclopedia of Social Theory*. Thousand Oaks, CA: Sage.

Seidel, S. 2011. Toward a theory of managing creativity-intensive processes: A creative industries study. *Information Systems and e-Business Management*, 9(4):407-446.

Seidel, S., Müller-Wienbergen, F. & Rosemann, M. 2010. Pockets of creativity in business processes. *Communications of the AIS*, 27:415-436.

Serumaga-Zake, P. 2014. Research methodology: Guidelines for master's and doctoral students (Unpublished).

Serumaga-Zake, P.A.E. 2016. *Business research module: Quantitative research*. Pretoria: Unisa SBL.

Sethi, V., Sethi, V., Jeyaraj, A. & Duffy, K. 2008. Organisation resource planning systems implementation in a global subsidiary organization: Lessons learned. *Journal of Asia-Pacific Business*, 9(4):373-394.

Sharma, N. 2014. Interprofessional learning (IPL) in medical education: Are we capitalising fully? *Medical Teacher*, 37(1):99.

Sherif, M.H. 2006. Standards for telecommunications services. In K. Jakobs (ed.). *Advanced topics in information technology standards and standardization research.* Hershey, PA: Idea Group, 183-205.

Silverman, D. 2001. *Interpreting qualitative data: Methods for analysing talk, text and interaction.* Second edition. London: Sage.

Simon, A. & Douglas, A. 2013. Integrating management systems: Does the location matter? *International Journal of Quality and Reliability Management*, 30(6):675-689.

Simon, A., Karapetrovic, S. & Casadesus, M. 2012a. Difficulties and benefits of integrated management systems. *Industrial Management and Data Systems*, 112(5):828-846.

Simon, A., Karapetrovic, S. & Casadesus, M. 2012b. Evolution of integrated management systems in Spanish firms. *Journal Cleaner Production*, 23(1):8-19.

Simon, M.K. & Goes, J. 2013. *Scope, limitations and delimitations*. Retrieved from http://dissertationrecipes.com/wp-content/uploads/2011/04/limitationscopedelimitation1.pdf [Accessed 15 February 2017].

Singer, J.D. 1971. *A general systems taxonomy for political science*. Morristown, NJ: General Learning.

Sirmon, D.G., Gove, S. & Hitt, M.A. 2008. Resource management in dyadic competitive rivalry: The effects of resource combination and deployment. *Academy of Management Journal*, 51(5):919-935.

Sirmon, D.G., Hitt, M.A. & Ireland, R.D. 2007. Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Review*, 32(1):273-292.

Sirmon, D.G., Hitt, M.A. & Ireland, R.D. 2011. Resource orchestration to create competitive advantage: Breadth, depth and life cycle effects. *Journal of Management*, 37(5):1390-1412.

Skocpol, T. 1979. *States and social revolutions: A comparative analysis of France, Russia and China.* New York, NY: Cambridge University Press.

Skrinjar, R., Bosilj-Vuksic, V. & Indihar-Stemberger, M. 2008. The impact of business process orientation on financial and non-financial performance. *Business Process Management Journal*, 14(5):738-754.

Smith, J. 2010. Exploring connection between global integration and political mobilisation. *Journal of World Business Systems Research*, winter 2004, 255-285 Special Issue: Global Social Movements Before and After 9-11.

Sousa, M.M. & Guimaraes, T.A. 2017. The adoption of innovations in Brazilian labour courts from the perspective of judges and court managers. *RAUSP Management Journal, Revista Administracao*, 52:103-113.

Stamou, T. 2003. Integrated management systems in small medium-sized enterprises: Theory and practice. Unpublished degree thesis. Norwich: School of Environmental Sciences, University of East Anglia, University Plain.

Stats SA (Statistics South Africa). 2017. Quarterly Labour Force Survey. Retrieved from http://www.statssa.gov.za/?p=9960 [Accessed 16 August 2017].

Steiber, A. & Alange, S. 2013. Do TQM principles need to change? Learning from a comparison to Google Inc. *Total Quality Management & Business Excellence*, 24:48-61.

Stone, S., Sweet, A. & Sandholtz, A. 1997. European integration and supranational governance. *Journal of European Public Policy*, 4(3):297-317.

Strand, R. 2013. The chief officer of corporate social responsibility: A study of its presence in top management teams. *Journal of Business Ethics*, 112(4):721-734.

Strydom, H. & De Vos, A.S. 1998. Sampling and sampling methods. In A.S. de Vos (ed.). *Research at grass roots: A primer for the caring professions*. Pretoria: Van Schaik.

Styhre, A. 2002. Non-linear change in organizations: Organisation change management informed by complexity theory. *Leadership & Organization Development Journal*, 23(6):343-351.

Swaminathan, J.M. 2001. Enabling customization using standardized operations. *California Management Review*, 43(3):125-135.

Swann, G.M.P. & Lambert, R.J. 2010. Why do standards enable and constrain innovation? In J.-C. Graz & K. Jakobs, K. (eds.). *EURAS Proceedings 2010: Service Standardization*, Université de Lausanne. Switzerland, 357-376.

Swann, G.M.P. 2000. *The economics of standardization*. Final report for the Standards and Technical Regulations Directorate, Department of Trade and Industry. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.430.1657&rep=rep1&type=pdf

Swann, G.M.P. 2005. *Do standards enable or constrain innovation?* DTI Economics paper no. 12. London: Department of Trade and Industry.

Tallon, P.P., Kraemer, K.L. & Gurbaxani, V. 2000. Executives' perceptions of the business value of information technology: A process-oriented approach. *Journal of Management Information Systems*, 16(4):145-173.

Hallström, K, T. & Boström, M. 2010. *Transnational multi-stakeholder standardization organizing fragile non-state authority*. Cheltenham: Edward Elgar.

Tamura, S. 2013. Generic definition of standardization and the correlation between innovation and standardization in corporate intellectual property activities. Science and Public Policy, 40(2):143-156.

Tanriverdi, H. & Uysal, V.B. 2011. Cross-business information technology integration and acquirer value creation in corporate mergers and acquisitions. *Information Systems Research*, 22(4):703-720.

Tarí, J. & Molina-Azorin, J. 2010. Integration of quality management and environmental management systems: Similarities and the role of the EFQM model. *TQM J.*, 22(6):687e701.

Tarí, J.J., Molina-Azorín, J.F. & Heras, I. 2012. Benefits of the ISO 9001 and ISO 14001 standards: A literature review. *Journal of Industrial Engineering and Manag*ement, 5(2):297-322.

Tashakkori, A. & Teddlie, C. (Eds.). 2003. *Handbook of mixed methods in social and behavioural research*. Thousand Oaks, CA: Sage.

Tassey, G. 2000. Standardization in technology-based markets. *Research Policy*, 29:587-602.

Tassey, G. 2003. *Method for assessing the economic impacts of government R&D.* Gaithersburg: National Institute of Standards & Technology.

Tavakol, M. 2011. Making sense of Cronbach's alpha*. International Journal of Medical Education*, 2:53-55.

Taylor, F.W. 1911. *The principles of scientific management*. New York, NY: Harper.

Tedla, T.B. 2016. The impact of organizational culture on corporate performance. Unpublished PhD thesis. Minneapolis, Minnesota: Walden University.

Tether, B.S., Hipp, C. & Miles, I. 2001. Standardisation and particularisation in services: Evidence from Germany. *Research Policy*, 1115-1138.

Thawani, S. 2004. Six sigma: Strategy for organisational excellence. *Total Quality Management*, 15:655-664.

Thiemann, M. 2014. The impact of meta-standardization upon standards convergence: The case of the international accounting standard for off-balance-sheet financing. *Business and Politics*, 16(1):79-112.

Thrift, N. 1999. The place of complexity. *Theory, Culture and Society*, 16(3):31-69.

Timmermans, S. & Epstein, S. 2010. A world of standards but not a standard world: Toward a sociology of standards and standardization. *Annual Review of Sociology*, 36:69-89.

Tomlinson, F. & Egan, S. 2002. From marginalization to (dis)empowerment: Organizing training and employment services for refugees. *Human Relations*, 55(8):1019-1043.

Tongur, S. & Engwall, M. 2014. The business model dilemma of technology shifts. *Technovation*, 34(9):525-535.

Turof, M. 2012. The current state of design and implementation of integrated management systems. *Economics, Management, and Financial Markets*, 7(4):726-732.

Ungan, M.C. 2006. Standardization through process documentation. *Business Process Management Journal*, 12(2):135-148.

Urwick, L.F. 1937. *The function of administration with special reference to the work of Henri Fayol.* In L.H. Gulick, L.F. Urwick & C.H. Pforzheimer. Papers on the Science of Administration. New York, NY: Colombia University Press.

Utterback, J.M. 1996. *Mastering the dynamics of innovation*. USA: Harvard Business School Press.

Van Niekerk, A.A. 2012. Curriculum framework for Geographical Information Science (GISc) training at South African universities. *South African Journal of Higher Education*, 26(2):329-345.

van Wessel, R.M., de Vries, H.J. & Ribbers, P.M.A. 2006. Effects of IS Standardization on Business performance: A Case in HR IS Company Standardization. In R.H. Sprague (ed.). *Proceedings of the Thirty-Nineth Annual Hawaii International Conference on System Sciences*. Los Alamitos, CA: IEEE Computer Society.

Vargo, J. & Seville, E. 2011. Crisis strategic planning for SMEs: Finding the silver lining. *International Journal of Production Research*, 49(18):5619-5635.

Venkatesh, V. 2006. Where to go from here? Thoughts on future directions for research on individual-level technology adoption with a focus on decision making. *Decision Sciences*, 37(4):497-518.

Viardot, E. 2010. Achieving market leadership: The next challenge for technology firms from growing countries. *Journal of Technology Management for Growing Economies*, 1:9-28.

Viardot, E., Sherif, M.H. & Chen, J. 2016. Managing innovation with standardization: An introduction to recent trends and new challenges. *Technovation*, 48-49:1-3.

Vitoreli, G. & Carpinetti, L. 2013. An analyisi of integrated management ISO 9001 - OHSAS 18001: *Journal of Quality Management*. *Revist*, 20(1):204-217.

Von Ahsen, A. & Funck, D. 2001. Integrated management systems: Opportunities and risks for corporate environmental protection. *Corporate Environmental Strategy*, 8(2):165-176.

Vroom, V.H. 1964. *Work and motivation*. New York, NY: Wiley.

Waclawovsky, E. & Batiz, E. 2010. Integrated management systems. *Journal of operations management*, 32:124-134.

Wagner, H.-T. 2006. A resource-based perspective on IT business alignment and firm performance. Unpublished PhD thesis. Frankfurt am Main: Institute for Information Systems, Goethe-University.

Wagner, M. 2014. The link of environmental and economic performance: Drivers and limitations of sustainability integration. *Journal of Business Research*, 68(6):1306-1317.

Walby, S. 2007. Complexity theory, systems theory, and multiple intersecting social inequalities. *Philosophy of the Social Sciences*, 37:449-470.

Walters, P.G.P. 1986. International marketing policy: A discussion of the standardization construct and its relevance for corporate policy. *Journal of International Business Strategies*, 17(3):317-23.

Walton, M. 2016. Expert views on applying complexity theory in evaluation: Opportunities and barriers. *Evaluation*, 22(4):410-423.

Wang, J. & Kim, S. 2007. Time to get in: The contrasting stories about government interventions in information technology standards (the case of CDMA and IMT 2000 in Korea). *Government Information Quarterley*, 24(1):115-134.

Weber, M. 1947. *The theory of social and economic organization*. Transl. A.M. Henderson & T. Parsons. Glencoe, IL: The Free Press.

Weber, Y. & Drori, I. 2011. Integrating organisational and human behavior perspectives on mergers and acquisitions: Looking inside the black box. *International Studies of Management & Organisation*, 41(3):76-95.

Weber, Y., Drori, I. & Tarba, S.Y. 2012. Culture-performance relationships in mergers and acquisition: The role of trust. *European Journal of Cross-Cultural Competence and Management*, 2(3/4):252-274.

Weber, Y., Tarba, S.Y., Stahl, G.K. & Rozen Bachar, Z. 2012. Integration ingenuity of international mergers and acquisitions: Test of a new paradigm. In Y. Weber (ed.). *Handbook of research on mergers and acquisitions*. Cheltenham, UK: Edward Elgar, 32-60.

Weick, K.E. 1987. Organizational culture and high reliability. *California Management Review*, 29(2):112-127.

Welman, J.C. & Kruger, S.J. 2005. *Research methodology* (2nd edition). South Africa: Oxford University Press.

Werle, R. & Iversen, E.J. 2006. Promoting legitimacy in technical standardization. *Science, Technology & Innovation Studies*, 2:19-39.

Wiener, A. & Diez, T. 2009. *European integration theory*. Second edition. New York, NY: Oxford University Press.

Wilkinson, G. & Dale, B. 2000. Management system standards: The key integration issues. *Proceedings of the Institution of Mechanical Eng*ineers, 214(9):771-780.

Wilkinson, G. & Dale, B. 2001. Integrated management system: A model based on total quality approach. *Managing Service Quality*, 11(5):318-330.

Wilkinson, G. & Dale, B.G. 1999a. Integrated management systems: An examination of the concept and theory. *TQM Magazine*., 11(2):95-104.

Wilkinson, G. & Dale, B.G. 1999b. Integration of quality, environmental and health and safety management systems: An examination of the key issues. *Proceedings of the Institution of Mechanical Eng*ineers, 213(3):275-283.

Wind, Y., Douglas, S.P. & Perlmutter, H.V. 1973. Guidelines for developing international marketing strategies. *Journal of Marketing*, April: 14-23.

Winship, J. 2005. *The first step forward: IT literacy policy project*. Council of Australian University Directors of Information Technology. Retrieved from http://www.caudit.edu.au/ [Accessed 7 April 2015].

Wiśniewska, M. & Stead, R. 2007. *Foundation quantitative methods for business*. Harlow: Prentice Hall.

Wiśniewska, M. & Szczepańska, K.A. 2014. Quality management frameworks implementation in Polish local governments. *Total Quality Management and Business Excellence*, 25(3/4):352-366.

Woessmann, L. 2007. International evidence on school, competition, autonomy and accountability: A review. *Peabody Journal of Education*, 82(2):473-497.

Wrighta, C., Sturdyb, A. & Wyliec, N. 2012. Management innovation through standardization: Consultants as standardizers of organisational practice. *Research Policy*, 41:652-662.

Wuellenweber, K., Beimborn, D., Weitzel, T. & Koenig, W. 2008. The impact of process standardization on business process outsourcing success. *Information Systems Frontiers*, 10(2):211-224.

Wüllenweber, K. & Weitzel, T. 2007. An empirical exploration of how process standardization reduces outsourcing risks. In W. Tim (ed.). *Proceedings of the 40th Hawaii International Conference on System Sciences (HICSS 2007)*, Hawaii.

Wüllenweber, K., Beimborn, D., Weitzel, T. & Koenig, W. 2008. The impact of process standardization on business process outsourcing success. *Information Systems Frontiers*, 10(2):211-24.

Xie, Z., Hall, J., McCarthy, I.P., Skitmore, M. & Shen, L. 2016. Standardisation efforts: The relationship between knowledge dimensions, search processes and innovation outcomes. *Technovation*, 48-49:69-78.

Yeung, A.K., Brockbank, J.W. & Ulrich, D.O. 1991. Organizational culture and human resource practices: An empirical assessment. In R.W. Woodman & W.A. Pasmore (eds.). *Research in organizational change and development*, Vol. 5. Greenwich, CT: JAI Press, 115-142.

Yip, G.S., Loewe, P.M. & Yoshino, M.Y. 1988. How to take your organisation to the global market. *Columbia Journal of World Business*, 23, Winter: 37-48.

Yoo, Y., Lyytinen, K. & Yang, H. 2005. The role of standards in innovation and diffusion of broad band mobile services: The case of South Korea. *The Journal of Strategic Information Systems*, 25:323-353.

Young, A., Klossner, J., Docherty, C.L., Dodge, T. & Mensch, J.M. 2013. Clinical integration and how it affects student retention in undergraduate athletic training programs. *Journal of Athletic Training*, 48(1):68-78. doi: 10.4085/1062-6050-48.1.22

Zack, M.H. 1999. Managing codified knowledge. MIT *Sloan Management Review*, 40:45-58.

Zeng, S.X., Shi, J.J. & Lou, G.X. 2007. A synergetic model for implementation of an integrated management system: An empirical study in China. *Journal of Cleaner Production*, 15(18):1760-1767.

Zeng, S.X., Xie, X.M., Tam, C.M. & Shen, L.Y. 2011. An empirical examination of benefits from implementing integrated management systems (IMS). *Total Quality Management*, 22(2):173-186.

Zi, K. & Blind, K. 2015. Researchers' participation in standardisation: A case study from a public research institute in Germany. *The Journal of Technology Transfer,* 40(2):346-360.

Zutshi, A. & Sohal, A. 2005. Integrated management system: The experiences of three Australian organizations. *Journal of Manufacturing Technology Manag*ement, 16(2):211-232.

ANNEXURE A

UNISA ETHICS APPROVAL LETTER

Graduate School of Business Leadership, University of South Africa. PO Box 392. Unisa. 0003. South Africa
Cnr Janadel and Alexandra Avenues, Midrand. 1685. Tel: +27 11 652 0000. Fax: +27 11 652 0299
E-mail: sbl@unisa.ac.za Website: www.unisa.ac.za/sbl

SCHOOL OF BUSINESS LEADERSHIP
RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

11 November 2016

Ref #: 2016_SBL_DBL_033_FA
Name of applicant: Mr S Naidoo
Student #: 78643481

Dear Mr Naidoo

Decision: Ethics Approval

Student: Mr S Naidoo, naidoosu@unisa.ac.za, 073 303 2828

Supervisor: Prof R Ramphal, ramphrr@unisa.ac.za, 011 652 0363

Project Title: A framework for the integration of management systems in organisations

Qualification: Doctorate in Business Leadership (DBL)

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

Outcome of the SBL Research Committee:
Approval is granted for the duration of the Project

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 09/11/2016.

The proposed research may now commence with the proviso that:

1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.

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ANNEXURE B

INFORMED CONSENT

Graduate School of Business Leadership, University of South Africa PO Box 392 Unisa 0003 South Africa
Cnr Smuts and First Avenue Midrand 1685 Tel: +27 11 652 0000 Fax: +27 11 652 0299
Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za

Informed consent for participation in an academic research project

A framework for the integration of management systems in organisations

Dear Respondent

You are herewith invited to participate in an academic research study conducted by Sugandren Naidoo, a student in the Doctor of Business Leadership at UNISA's Graduate School of Business Leadership (SBL).

The purpose of the study is to help organisational practitioners and managers to predict activities regarding integration in organisations. Also, this understanding will expose the instrument that fosters integration implementation and management, allowing researchers, managers, and policy makers to better understand the underlying forces of integration.

All your answers will be treated as confidential, and you will not be identified in any of the research reports emanating from this research.

Your participation in this study is very important to us. You may however choose not to participate and you may also withdraw from the study at any time without any negative consequences.

The research will require face to face interviews and as you have been selected to participate you would provide valuable information related to the field of study.
The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.

Please contact my supervisor, Prof RR Ramphal, on email at: ramphrr@unisa.ac.za, if you have any questions or comments regarding the study. Please sign below to indicate your willingness to participate in the study.

Yours sincerely

Sugandren Naidoo

I, _____ herewith give my consent to participate in the study. I have read the letter and understand my rights with regard to participating in the research.

_____ _____

Respondent's signature **Date**

ANNEXURE C

INTERVIEW GUIDE

GRADUATE SCHOOL OF BUSINESS LEADERSHIP (SBL)

PARTICIPANT INFORMATION SHEET

Dear Participant

My name is ***Sugandren Naidoo*** and I am conducting research with my supervisor, ***Prof, R.R Ramphal***, School of Business Leadership, towards a degree of Doctor of Business Leadership (DBL) at the University of South Africa (UNISA). We are inviting you to participate in a study entitled "**A framework for the integration of management systems in organisations**".

Purpose of the study

The purpose of the study is to provide a framework for successful implementation and amendment of new and current management systems for organisations.

Why am I being invited to participate?

As an industry expert in the field of study, you have a good understanding, knowledge and experience on the subject to be researched. Your participation is voluntary and there is no penalty or loss of benefit for non participation.

About the interview

You were selected to participate in this study because your involvement with respect to management systems. By completing this interview which would take approximately 45 minutes, you agree that the information you provide may be used for research purposes, including dissemination through peer-reviewed publications and conference proceedings. There are no risks or harm associated with participating in the study. You are welcome to withdraw from the study at any time during the interview without obligation or any adverse effects. There will be no reimbursement, reward, compensation or gifts for participation.

Confidentiality

Any information of any participant will be respected as private and will only be known by the researcher. The reporting of the information will be done in such a manner that all the participants will be unrecognisable. The study is for research purposes only and the results will be used for research and may be included in a scientific journal.

Benefits of the study

It is anticipated that the information we gain from this interview will help practionnaires, managers and policy makers to inform or streamline processes and to enhance various forms of management systems in their organisations.

Willingness to participate

Your participation in this study will not only contribute to the research, but may also positively influence the integration of systems in organisations. You may contact the researcher (details on page 1) to ask any questions on the study.

Feedback on the study

Participants can contact the researcher regarding the outcomes of the study from the information provided below:

Sugandren Naidoo
Office : 012 426 3304
Email : naidoosu@unisa.ac.za

Kind regards

Sugandren Naidoo

Study supervisor

Prof Roy Ramphal

The following interview guide will be used:

A: Opening the interview (all covered in less than 5 minutes)

1. Thank the participant for the time taken to contribute to the research.
2. Outline the purpose of the research and the progress.
3. Participant to provide a brief background on their work experience.

B: Actual interview

Interview questions

1. Discuss the type of management systems in your organisation?
   a. How would you define a system?
   b. What would you define as an integrated management system?
   c. How would you define a standardized and combined system?
      Probe: ask for examples.

2. Describe how do you work with multiple systems in your organisation?
   a. Once you have a new system that is required by the organisation? What happens next?
   b. What is your view on integration, standardisation and combination?
   c. Probe: [how it is undertaken in the organisation].

3. In your view can you describe if at leadership level, are management systems integrated or combined system?

4. Describe the policy on integration in your company?
   Probe: [how it is undertaken in the organisation].

5. To what extent are the different management systems combined and/or integrated within your organisation.

6. What would the role of senior and top management regarding management of these systems?
   Probe: [how it is undertaken in the organisation].

7. How would you describe the process of managing the integration/combination/standards of new systems (and amendments) into the organisation?

8. What would you say are the challenges facing integration of management systems?

9. What are the benefits of integrating management systems?
10. How do you determine the maturity of integration in your organisation? example Level 1/ Level 2/ Level 3?

11. Do you have a framework you use for the integration of management systems in your organisation presently?

12. Validation of the IMS framework the IMS framework.
    Probe: [request participant views?]

13. What are the factors in your view I should address that I have not highlighted in the open ended questionnaire as yet?

C. Closing

1. Thank the participant for their time taken to contribute to the research.
2. Request participants from (ICT) organisations to endorse the quantitative part of the research.

ANNEXURE D

RESEARCH QUESTIONNAIRE

Dear Participant

My name is Mr. Sugandren Naidoo and I am a lecturer in Operations Management at UNISA, Department of Operations Management. I have been granted permission by your organisation to conduct this study. The research is important for the promotion of integration of management systems in organisations and is funded by the University of South Africa.

The study has been approved by the SBL Research Ethics Committee with Ethics certificate number (2016_SBL_DBL_033_FA) and you can contact the research manager, Mrs. Nthabiseng Motloi (011-6520372; email: motlonc@unisa.ac.za), should you have any concerns regarding the process and conducting of this research. A copy of the ethics certificate can be made available if required.

<u>Below are answers to a few questions you may have:</u>

What is the aim / purpose of the study?

The aim of this study is to develop a framework for the integration of management systems in organisations. Your participation will allow me to gather critical data for the study, which may also be used for other outputs such as articles, books, conferences and workshops,

Why am I being invited to participate?

You have been selected by your organisation to participate due to your experience and knowledge of management systems.

What is the nature of my participation in this study / what does the research involve?

The first phase of the study was a face to face interview, which was completed by your leader in the organisation. The second phase of the study involves data collection. By completing this survey questionnaire, you will be contributing to this phase of the study.

Section A: SECTION A
BIOGRAPHICAL INFORMATION

A1. What is your employment status?

Select the relevant answer and where applicable, annotate your answer.

Permanent ☐

Contract ☐

Other (specify) ☐

Other (specify)

A2. What is the total number of years you have been employed?

A3. Indicate the number of years you have been in your current position?

Years

Months

A4. When working on systems, which of the following levels do you perform on?

Technical Support ☐

User ☐

Management ☐

Other (specify) ☐

Other (specify)

A5. Please select your highest qualification?

Grade12 (Matric / National Senior Certificate) ☐

Higher Certificate ☐

Diploma or Advanced Certificate ☐

Bachelor's Degree or Advanced Certificate ☐

Honours degree, Postgraduate Diploma or Professional Qualification ☐

Master's Degree ☐

Doctoral Degree ☐

Other (specify)

Other (specify)

Section B: SECTION B

QUESTIONNAIRE

B1. Management: responsible for planning, organising leading, and controlling resources in the organisation.

	1	2	3	4	5	6	7
Management should demonstrate knowledge of implementing management systems.	☐	☐	☐	☐	☐	☐	☐
In my opinion, management should motivate employees to use organisational systems.	☐	☐	☐	☐	☐	☐	☐
Management should understand that multiple management systems are important for accurate reporting.	☐	☐	☐	☐	☐	☐	☐
Efficiency should be a driver for management during the implementation of multiple systems.	☐	☐	☐	☐	☐	☐	☐
Management uses multiple systems to ensure transparency in the organisation.	☐	☐	☐	☐	☐	☐	☐
Management uses formalised systems to enable organisational goals.	☐	☐	☐	☐	☐	☐	☐
Management should incorporate systems to produce a product or service that benefits the customer.	☐	☐	☐	☐	☐	☐	☐
Multiple management systems should be developed and implemented by management consistently.	☐	☐	☐	☐	☐	☐	☐
I understand the operating of multiple management systems in my organisation.	☐	☐	☐	☐	☐	☐	☐
Management should encourage input from staff regarding management systems implementation.	☐	☐	☐	☐	☐	☐	☐

B2. Standards: a set of guidelines, principles, procedures or work instructions introduced by management and executed at operational level.

	1	2	3	4	5	6	7
Standards should be seen as improving the competiveness of the organisation.	☐	☐	☐	☐	☐	☐	☐
Standards should be seen as improving agility in an organisation.	☐	☐	☐	☐	☐	☐	☐
There is an agreement of standards implementation process in the organisation.	☐	☐	☐	☐	☐	☐	☐
Standards are seen as stifling innovation in the organisation.	☐	☐	☐	☐	☐	☐	☐
Standards improve consistency in process performance.	☐	☐	☐	☐	☐	☐	☐

B3. Leadership: the senior management of an organisation that sets the vision and direction of the company.

	1	2	3	4	5	6	7
Leadership uses management system/s to set objectives for the organisation.	☐	☐	☐	☐	☐	☐	☐
In my opinion, leadership have recognised the benefits of implementing management systems in organisations.	☐	☐	☐	☐	☐	☐	☐
I believe that leadership should be making informed decisions by using management systems.	☐	☐	☐	☐	☐	☐	☐
In my opinion, leadership should develop formalised management processes to address multiple systems.	☐	☐	☐	☐	☐	☐	☐
Leadership should utilise the benefits of management systems to keep employees motivated.	☐	☐	☐	☐	☐	☐	☐
I believe leadership utilises management systems to improve customer satisfaction.	☐	☐	☐	☐	☐	☐	☐
I believe that management systems enable stakeholder management.	☐	☐	☐	☐	☐	☐	☐
Leadership encourages input from staff regarding management systems implementation.	☐	☐	☐	☐	☐	☐	☐
In my opinion, a policy for the management of systems is important.	☐	☐	☐	☐	☐	☐	☐
In my opinion, the business strategy should be aligned to organisational culture.	☐	☐	☐	☐	☐	☐	☐

B4. Policy: expressed by leaders in an organisation through a formal documented process.

	1	2	3	4	5	6	7
Documented policies are driven at leadership level.	☐	☐	☐	☐	☐	☐	☐
Policies should be effectively communicated throughout the organisation.	☐	☐	☐	☐	☐	☐	☐
Multiple policies are facilitated during implementation in the organisation.	☐	☐	☐	☐	☐	☐	☐
New policies are introduced through standardised systems by management.	☐	☐	☐	☐	☐	☐	☐
Management system policies should be applied consistently throughout the organisation.	☐	☐	☐	☐	☐	☐	☐

B5. Performance: the act of showing positive or negative results in an organisation.

	1	2	3	4	5	6	7
Multiple management systems should improve efficiency in the organisations.	☐	☐	☐	☐	☐	☐	☐
Setting objectives should drive organisational performance.	☐	☐	☐	☐	☐	☐	☐

	1	2	3	4	5	6	7
Co-ordination of organisational goals improves performance.	☐	☐	☐	☐	☐	☐	☐
In my opinion, controlling organisational goals improves performance.	☐	☐	☐	☐	☐	☐	☐
Innovation should be seen as an enabler for improving performance in the organisation.	☐	☐	☐	☐	☐	☐	☐
In my opinion management systems allows for more control over my job.	☐	☐	☐	☐	☐	☐	☐
Management systems auditing should improve the organisation's performance.	☐	☐	☐	☐	☐	☐	☐
In my opinion, management systems should contribute positively to team performance.	☐	☐	☐	☐	☐	☐	☐
I believe that achieving results are the collective work of all structures within the organisation conforming to the predefined goals of the organisation.	☐	☐	☐	☐	☐	☐	☐

B6. Effort: the amount of energy and determination used to obtain a goal.

	1	2	3	4	5	6	7
The effort of knowledge transfer is good in our organisation.	☐	☐	☐	☐	☐	☐	☐
Multiple management systems implementation should be executed at operational level.	☐	☐	☐	☐	☐	☐	☐
The effort in formalising systems should improve organisational efficiency.	☐	☐	☐	☐	☐	☐	☐

B7. Culture: the beliefs, morals and values an organisation exhibits.

	1	2	3	4	5	6	7
There must be a culture of improving systems in the organisation.	☐	☐	☐	☐	☐	☐	☐
The organisational culture should be enabled by top management.	☐	☐	☐	☐	☐	☐	☐
Organisational culture must be the driver for improved performance.	☐	☐	☐	☐	☐	☐	☐
A high performance culture is an enabler for performance of multiple management systems in the organisation.	☐	☐	☐	☐	☐	☐	☐
In my opinion, the organisational culture is aligned to organisational strategy.	☐	☐	☐	☐	☐	☐	☐

B8. Innovation: the act of invention or modernisation of processes and systems.

	1	2	3	4	5	6	7
In my opinion, management should analyse the organisational human resources in order to create a more fertile ground for the implementation of innovation.	☐	☐	☐	☐	☐	☐	☐

	1	2	3	4	5	6	7
The environment for innovation must be set by top management.	☐	☐	☐	☐	☐	☐	☐
In my opinion, superior customer value is created through innovation in the organisation.	☐	☐	☐	☐	☐	☐	☐
The organisation's management should put significantly more focus on processes in order to address innovation issues regularly.	☐	☐	☐	☐	☐	☐	☐
Management should enable a process for innovation by providing platforms for such undertakings.	☐	☐	☐	☐	☐	☐	☐
In my opinion, we need management and strategies for innovation in the organisation.	☐	☐	☐	☐	☐	☐	☐
Innovation is monitored through formalised processes in the organisation by management.	☐	☐	☐	☐	☐	☐	☐
In my opinion, innovation is used as a tool for continuous improvement in the organisation.	☐	☐	☐	☐	☐	☐	☐

B9. Motivation: the drive and inspiration to achieve organisational objectives.

	1	2	3	4	5	6	7
I am motivated to achieve the goals of the organisation.	☐	☐	☐	☐	☐	☐	☐
Management must set challenging objectives for its employees to meet organisational goals.	☐	☐	☐	☐	☐	☐	☐
I believe that management should enable platforms for job enrichment.	☐	☐	☐	☐	☐	☐	☐

B10. Targets: the drive and inspiration to achieve organisational objectives.

	1	2	3	4	5	6	7
Targets are introduced via change management processes.	☐	☐	☐	☐	☐	☐	☐
I believe that incorporation of multiple management systems is difficult in the organisation.	☐	☐	☐	☐	☐	☐	☐

B11. I would like to see more of the following in our organisation's management system.

B12. I would like to see less of the following in our organisation's management system.

B13. What, in your view, are the biggest benefits of the management system in your organisation?

B14. What is/are the biggest challenge/s regarding your organisation's management system?

B15. **Please provide any general comments regarding the study of multiple management systems in organisations.**

Thank you for participating in this research study.

ANNEXURE E

TRANSCRIPTS

Interview **1**

Sector **ICT**

Respondent occupation **CHIEF INFORMATION OFFICER**

Interviewer: Good morning, firstly, thank you for affording me the opportunity to interview you at offices. Before we start, can you please give me a brief overview of your experience, your academic background and your involvement in ERP systems, or management systems?

Respondent: Okay. Alright, so obviously it's Jansen. So, I work for the company called. It's a FTSE 100 company, listed in the UK. So I've been with this company for eight years now, just more than eight years – so it's quite long. The reason why I've been with at company so long is because it changed so often. Because it's a global company, we're in 23 countries worldwide. That's a massive company, it's very big. In some cases we're the biggest in some software areas. So the company's focus would be three major areas. So it's from an actual perspective, which includes payroll, then from an accounts perspective, and then payments. So we've got three areas, so we call it the golden triangle. So, payments is quite a big thing for us. We're not going to focus on that, because that's not really a back office system. Then we've got accounting packages, which includes ERP systems. Then we've got payroll systems, which includes HR systems. So what we did was, in the past we used to have all these different areas we focused on. HR, we focused on payroll, and all those types of things. So what we did now, we combined it. So everything that relates to payroll, which includes HR is now combined and then anything that included accounting, including ERP and stuff like that is now combined. And then we've got the payments, which is just like an extension of the company, so payments we focus on stuff like, you know, debit order type transactions, payroll – so if a payroll gets paid, paid through our company as well. So it's just an extension of the company, so it's fully integrated. Also, the integration extends. So payroll is integrated with HR, is integrated with ERP integrated with payments and that's where this thing comes out. So, from a Global perspective, we're listed in the UK, FTSE 100 we are quite big in North America. South America we've got a couple of companies there, where our headquarters in Sao Paulo, then we've got UK and [Ireland and UK] where the company started; we're a very big market leader there. In Europe we are very big in Germany, France, Spain, and in everywhere else. Poland.

Interviewer: Europe, and presence?

Respondent: Ja, no. We're very big in those countries. We're also in other countries as well like Portugal and stuff like that, but in those three we're quite big. In Africa, our headquarters is South Africa, we are definitely the leader in Africa from a payroll and an ERP or accounting perspective. We estimate that from a payroll perspective in South Africa, we've got more than 70% of the market. Accountings bigger – smaller companies. Then in Australia we're quite big but we're not a market leader yet and then in Asia we're also picking up now. So my region – I'm the CIO for Africa, Australia, Middle East and Asia, this is my region. Up until recently South America was part of my region as well. So, anything related to our own systems and then other internal systems is what we focus on, and I think in a nutshell, that's it. So we develop our own products, we don't resell any other products. So everything that we sell, we developed ourselves. In South Africa there's obviously a huge hub of developers here, which sits, from a payroll perspective, the Pretoria office is traditionally the payroll. We've got close to, I think, 400 developers in South Africa, which is quite a lot, focussing on our own products and development.

Interviewer: Are these developers outsourced, or?

Respondent: No, internal.

Interviewer: Internal. Just to let you know, I will be having a questionnaire as well. You know, the quantitative part. So, can I just forward it to you and then you can distribute it? Or maybe give me the email base and I can send it out as well.

Respondent: Let me rather send it out, otherwise the guys won't know, otherwise they won't read it.

Interviewer: True. Thank you so much for that. I really appreciate that. In terms of your experience and background in management and integration, we spoke about two very important terms that's critical for the study, combined and integrated. But I'm going to get back to them. But just in terms of your experience in management and integration?

Respondent: So in what sense?

Interviewer: So, prior to joining.

Respondent: Okay. So I've been in IT my whole life. I studied at UCT – engineering. Electronic engineering. I've never worked as an engineer. So, I started in IT and I've been working in IT since after varsity. So, since then, when we look at internal systems like CRMs, ERPs, those type of things …

Interviewer: An integral part of …

Respondent: Ja, of my portfolio.

Interviewer: Okay. I think, how would you define a system?

Respondent: Any system?

Interviewer: Any system. It can be an open system, closed system. Just your view.

Respondent: So I do focus on a couple. So we've got – and it's not rocket science – so obviously we look at financial systems. Then we look at – and financial systems include a lot of different things. I mean, it's procure to pay, audit, cash, so report to report. So when you look at any financial system, those are the main three things you look at, okay. Then we look at the HRIS systems. So that's your HR – information systems. This includes payrolls, HRs those type of things. And then we look at – the other very important thing is what we all the marketing operations side. So in any business they need a proper marking system. So, and we can touch on there at an integration level. So those are the three main components that a company uses to make money, and we only do business to make money, okay. So when you look at it, for instance, from a marketing perspective, marketing operations, just also support your sales component. So – and integration – so, in other words, what process do you need to follow to get a proper leading place? And all those three systems integrates 100%. So, integration's quite important.

Interviewer: How would you? What would you say is integration? What would be your definition of integration?

Respondent: My definition is a seamless integration. No manual intervention. That's very important. Seamless and secure. Seamless integration. And the buzzword there is obviously APIs.

Interviewer: APIs ?

Respondent: Ja. Application programmable interfaces. But in any case, so the whole thing about this, is that you need a system. If you look at those main systems, there are a hundred things that you have to look at and you have to align that with your business needs. So, that's why not everybody is using Oracle or SAP or our own system, systems, it's not necessarily a perfect fit for the needs of your company. So the way that it's working now – okay, I must just quickly explain to you my strategy. So my strategy is quite clear. It's cloud first, partner second, in-house last. Okay. So the intention for me is not to bring any systems in-house. We don't do that. I don't like it and what I mean by that is, the minute you bring a CRM system in, or an ERP, you need to build capability, so there's risk involved. Cost involved, blah, blah, blah. So, if I could find a product, that is a cloud product, I would first go with the cloud product. Obviously you know, the garden magic oven thing – is quite an important thing. So only if I can't find a cloud solution to fill the gaps, then I will partner with someone, and if I don't get that, then I will go in house. So

that's my strategy. So if you look at our product and where we're going, from a perspective to our clients, I'm used to go cloud – full out cloud.

Interviewer: Cloud first?

Respondent: Cloud first. And what I mean by that, we recently bought a share in a company. We're most probably going to purchase the whole company, called Fairsail. Fairsail with an S – A – I – L at the end. Now this is an HR product, but full in the cloud – excludes payrolls. So what we've done is, we will now match this up with our own products. So for instance, if we've got an ERP product, we've got a payroll product. Fairsail will rebundle it. So we already took the first step to put the Fairsale – which is a proper [sales multi-tendency] kind of product, we'll put it in a cloud, but we'll integrate to our local on-premise products. Only way you can do that is by creating an API. That's quite important, and that's to secure seamless integration between your on-premise product, which could be any payroll, not necessarily our payroll, that will integrate with the cloud products and HR product. And this allows multi companies, global companies, you know, multi-country to have one view from an HR perspective of all the companies around the world, but because of the complexity of the on-premise or in-country payrolls, we still allow them to have their own payrolls, but integrate seamless into that. Okay, so cloud first, partner second, in-house last. That's quite important, for any products. Okay, and I talk about myself. That's quite important, so the integration part of it needs to be solid. Needs to be reliable. It needs to be secure.

Interviewer: I just want to ask a question here. On Fairsail, do you integrate your systems with Fairsale, or you combine?

Respondent: Okay, so Fairsale is a cloud product, and that's what we want. We integrate it from various aspects. So obviously Fairsale is not as mature as to replace any HR internal system, but a great functionality of that can be replaced by cloud products. Now obviously the advantage of cloud is cloud. You've got one instance, one view, it's always accessible. The risk factor is massive. If you look at us alone, we're in 23 countries, plus minus, okay. Now if we've got – thumbsuck – we've got at least so in South Africa, till very recently, in fact, till the end of September, we had five different companies in Africa. In fact, we still have nine, so five in South Africa, then we've got Botswana, Namibia, Nairobi and Lagos. So, in fact, we had four on nine different systems. What we do, is we replace the great functionality from an HR perspective in a cloud. So immediately move five systems away from on-premise, so your risk is low, you don't need a team, whatever, move into cloud, so that's it. integrate with local payrolls, and that's why the APIs are so slow and so strong. Now everything is now API driven. So what you do is, you create an API that you can take clients that don't want or that's not currently using our own payrolls, but their own payrolls and you create an API that they can go to. So they can use their own payroll in country with their own rules, but still utilise our product with Fairsail which is a back office product. Now just hosted in cloud.

Interviewer: Fantastic. Is that something new?

Respondent: It's the way the worlds going. So if you look at all our competitors, they've got similar products, ja. And that goes for a lot of different things. So we've got a strategic partnership with Salesforce – it's a market leader from a CRM perspective, it's once again from a CRM perspective, we are utilising Salesforce …

Interviewer: to get it out there.

Respondent: Exactly. And that's also been sold to other clients. So once you sort out the integration, you can actually integrate it with basically any product out there, if that makes sense.

Interviewer: Yes, sure.

Respondent: Okay?

Interviewer: Okay, thank you for that. It was really great. I think you've answered my section B; "Discuss the types of management systems within your organisation" and you've given me some good examples as well. Thank you for that. How do you work with multiple systems in your organisation? Let's look at a strategic level and then probably at a business unit level.

Respondent: Okay, so first of all, we're very unique I think. We're eating our dog food so to speak. So from a user perspective, we use our own stuff. From an ERP perspective, we use our own stuff, but as I explained earlier, I mean Fairsail is something we haven't developed ourselves, but we're also using that. Salesforce we haven't developed ourselves but we're also using that. We're using other third party products, for instance, Eloqua, which is an Oracle marketing product, cloud product for marketing purposes. Remember I said marketing operations, so generate leads. The whole leads process from a marketing perspective, we outsource certain portions. So there's a number of things that you can do to actually do that for multiple systems. You need an integration layer – which is quite important – so we're using a company or a product called Informatica. Now Informatica is a cloud product, and what this Informatica is doing, is creating a connection layer between multiple products – be that cloud, on-premise, whatever and they call it a data masking process. So it's a secure way of working through a layer to connect to other third party sockets out there if the APIs are correct.

Interviewer: Is it an interface?

Respondent: It's an interface. They call it masking technology. So it's a secure way of connecting other products with your local on-premise products. Okay, so, change of data, move of data through proper APIs and coordinating when what you have. Okay, but there's a lot of different technologies out there that's very similar. We're using Informatica. So it's a masking type of technology where you've got a secure way of moving data at the relevant times from on-premise products to cloud products and vice versa. So just to give you an example, so we use Salesforce from a marketing leads perspective, but we've also got on-premise CRM's – on-premise ERPs. And then we use another third party company from a marketing perspective, Eloqua. So that's an online product that's managing the whole marketing process. So that's a unique product – unique functionality there. We connect using a product called Informatica. So what this does is, we set the rules, so Eloqua knows when it needs to pull information from on-premise products, so on-premise CRMs, it pulls information through Informatica, Eloqua. Eloqua does the work, sends out complaints blah, blah, blah and updates through the sun layer and Salesforce. Now the reason we're using Salesforce CRM is because we want – in my region for instance – a lot of other people that is not in-country to have access to what from a CRM perspective, client management system, what has happened with that client. So in other words, has this client been identified as a possible lead? Have they received emails or different marketing campaign? So we've got one central view in cloud. We use multiple other technologies out there that specialise on their own, but all the information is on local. So, and that's where the combination comes in. So the aim is – and this is where the world's going, it's not to focus on one product's functionality. You look at the best of beta out there. For instance, the Oracle Eloqua product, we don't use everything, we use what we think is the best within that frame and that's what's nice about today's technology, you don't have to take a whole package.

Interviewer: Just take a module for example.

Respondent: But you do actually have to have a secure way of connecting. Interconnecting …

Interviewer: And Informatica does that?

Respondent: Well, ja, that's the data masking stuff, but yes. So you coordinate with that.

Interviewer: Thank you. I just want to mention something. We spoke a lot about the technical part, but you've also mentioned combined. You say that some of your systems are combined.

Respondent: Combined?

Interviewer: You just mentioned that something was combined. No? Okay.

Respondent: So, I mean …

Interviewer: Are you differentiating between integrated and combined, or is it one and the same?

Respondent: Ja, no, no, no. It's definitely not one and the same. I'm not sure what I meant by combined. Sorry, I …

Interviewer: Okay, okay, because I just picked up that. Right, there's no problem. I'll continue. Once you have a new system that is in your company that needs to be implemented for example, what are the steps you take for the process to be rolled up?

Respondent: Okay, so we've got an advance – an extensive method for doing that, obviously you need to do a proper due diligence on the product itself. So currently what we're doing, we've got what we call a governance board. So we don't implement anything in-country anymore, this is now a global initiative. So remember, there are a couple of components to IT. One is from an architechural point of view. Then we've got what we call business application point of view and then we've got infrastructure operations. And then combined with that you've still got security. Okay, so security is a very big portion of this. Okay, so what's happening, is that from the architectural point of view, first of all they do have proper due diligence on the product itself and then obviously the leads. So what is strategically happening in the company – where we're going – in the next couple of years, architecture will be involved, look at the product functionality, business applications is more about what are we currently using, and from an architectural and strategy point of view what gaps we need to fill. Keeping in mind that the focus is on cloud first, partner second, in-house last. So our aim is, if a gap is being identified, those people or those areas will try to find a solution that is suitable for us in the cloud, and that we can utilise globally. Okay, so the aim is not to install anything on-premise. Then, from a security point of view, because we deal with data, it's crucial that security is part of it from the word go. Now they are the tricky in that the moment you move stuff out of the country, the moment you store information we need to look at local legislation and also because we're a global company in the UK, we need to look at that legislation that filters down onto local – so, it's quite an extensive process. So just to add some detail to that: So we've got a process which we call the gate process. So a lead arises in the company, is identified by whoever, the business itself, sales, whatever, it follows certain gates. So the first one is a gateway; we call it Gate 0. There is this Gate 0 process, we're looking at basic stuff. So we've got our business principles, for instance, customer for life, new customer acquisition, those type of things. So first of all, in the Gate 0, we identify that whatever these guys need, we would add that into the company. Okay, so it's not just a – in the olden days, an MD will say that he needs a new CRM because he wants to do this. Now with this gate process, we brought in, it's easier for us to determine, will there be value for the company? Will this align with the global strategy? Because that's quite important. So the only when it passes Gate 0 – which is a quick process. It's a weekly process. We get the information there, then if that gets approved at Gate 0, so in other words, it won't clash with the global strategy, nothing like that, then it will move into what we call Gate 1. Now Gate 1 is where architectural becomes available, business applications, security. So they've got to work within that. So if we look at the business applications, business applications knows exactly what the company needs. If you look at the request, and it will determine, is this a fit for the business. Architectural will get involved, but not just from an IT architectural point of view, from a product architectural point of view. So they will go in-depth, look at the processes, look at, are there APIs, stuff like that. So depending, we can even go to Gate 4, depending on the complexity.

Interviewer: So there's obviously another two more gates that goes through gates 2 …

Respondent: Ja, but it hardly ever goes there because for instance, thumbsuck: If Its involvement is less than two days, it will be at Gate 0. Anything more than that up until 200 days will be at Gate 1. Now that's where the architectural guys around the world gets involved. They do due diligence and look at various products and those type of things. And obviously as I mentioned, hundreds of times, cloud first. So our aim, because we're a global company, is not to do anything local/global. Okay, so, and that's what we're focusing on. That's quite an extensive process and we use certain standards there, so it's not … From an architectural point of view we use things like Tugas. But any case, it's architectural so …

Interviewer: So these standards here, what happens with these standards? Well obviously it's coming from corporate, right?

Respondent: This is IT function. So all those – everything that I've mentioned now is IT. So what we've got is, we've got a global component, architectural strategy. But we've also got a

local component. Security global, security local. Our security local guys will have an impact on this, so if it is PII information, personally indentifiable information, can it move out of the country? So that security person, he has to sign it off and say, you know what, whatever we propose from an architectural point of view, blah, blah, blah point of view, it is fine because we're ticking everything off and if we don't tick all of those off, it doesn't go to the next stage. And then we've got a governance board as I've mentioned that sits on a regular basis and our part of that governance board to determine what the value will be and it's – ja, we need to be able to measure it – the value. That's quite important. So it sounds like a lengthy process, but from a governance point of view it is very important to have it in place. Otherwise you're going to get to a stage where we are now, where we've got in South Africa we've found five different backup systems, which is our own systems, but we're not on one system. So …

Interviewer: Ja, I understand it, ja. Thank you, for that really detailed and informative discussion. Discuss the policy on integration in your company.

Respondent: Well, we don't have a policy per se to say, you know, what needs to be ticked off from an integration point of view. We don't have that in place. We follow the same governance that I've just given to you now. It needs to be secure. So I think, so it depends. There's a lot of different frameworks that you need to keep in mind. So we don't do anything on the fly, we follow frameworks. So you must be aware of the ISO 27001 framework …

Interviewer: Yes.

Respondent: Ja, exactly that. So we're very strict on that. So we've got a couple of frameworks in the company. We've got what we call infrastructure operations framework, or internal controls framework. It's the same thing. Then we've got our online controls framework, and all of that are governed by the ISO 27001. So our primary aim is to protect data. So, with the other frameworks we've got in place, that is to ensure that we fill the gap. We identify the needs properly and we fill that and we've got all the controls in place to make sure that the system runs. But ultimately we focus on 27001.

Interviewer: Which is a local driver … well, it's a local standard, South Africa standard?

Respondent: No, no, no, international.

Interviewer: International?

Respondent: Ja.

Interviewer: Okay.

Respondent: But remember, we've got a couple. So in South Africa, we've got the POPI, which is communication. We've got ISO, we've got SOC's in America. Oxley. We've got … There's a couple. In Europe we've got European Data Protection Act and because we're a European company, a UK company, we need to comply with that as well. So lucky for us we've got the POPI Act. So, okay, so our main aim is, whatever systems we bring in, first focus on security. Make sure our data is secure, then obviously, we look at the function against that according to our which is according to our frameworks.

Interviewer: What were the role of senior and top management regarding management systems?

Respondent: Well, I obviously, all those management systems are my responsibility as CIO of the group. So that's ultimately the case. And then what we've done is, if you look at the structure, itself, each of those areas that I've just described, our architechral strategy blah, blah, blah, including the MDs, which is, they've got their own responsibility.

Interviewer: So in terms of senior management, if you look at the top echelon, then they have their own responsibilities and accountability.

Respondent: Correct.

Interviewer: But in terms of senior management, do they … what you're saying, this is the strategy, and that strategy obviously just gets distilled into the senior management in terms of …

Respondent: Ja, so, are you talking about the systems itself, or are you talking about the business? Because the systems are my responsibility. So I need to do a proper analysis, and

we've got the proper processes in place to determine what system implementation So when we implement the system it is my responsibility to make sure that we tick all the boxes. And this is why we follow such a strict process, to make 100% sure that when we put in the system, it is in line with what is done.

Interviewer: No, great stuff, okay. So it's ultimately you are responsible and accountable for …

Respondent: So, okay, so I must just quickly explain how it works. So, from a global perspective, we've got what we call a VSGM. So, vision, strategy, goals and measurements. Those are the four things that we focus. So Stephen Kelly, which is our CEO of the group, okay, he's got the VSG, which he's, because we're a listed company, we say, okay, this is our vision, okay. Our vision is to grow by this percentage, blah, blah, blah. Our vision is to have a certain percentage from the operating margin. This we give through to the stakeholders and the shareholders and the shareholders accepts and signs it off. And that ultimately comes down. So if you look at for instance the vision. Our vision is to focus on customer for life, new customer acquisition, and whatever we do, if it's a CEO or country, if it's CIO of the country or the region, whatever I do, should support this. Okay, my vision he's got, okay. So if you look at customer for life, from a back office point of view, it's my responsibility to put back office systems in place that supports customer for life. So the analysis, everything goes back to what Steven Kelly said is our vision. And if it's an MD, which is not, his decision making is not on back office systems, he's got his own VSG but only to support the business. So my responsibility is to put everything in place to make sure that I enable to business to make sure we've got the customer for life strategy. So all businesses. So if you look at the definition of customer for life, we've already got a customer. So what we need to do from a back office perspective, to support the business, to make sure we never ever lose the customer, and the systems are very important. So, if you look at integration, to come back to your question. So integration is way bigger than just financial systems, than just CRM systems. It's bigger, it's system, which is a back office system. So if a customer phones, okay, to give him super customer support, onscreen it pops up: this customer, the name of the customer, who the customer dealt with last, what problems did he have? What products has this customer got? Everything. Now that comes from our systems. So a strategy we've got, once again, cloud first. Okay, so we're moving away from on-premise Telerik systems. Okay, because we focus on the cloud now, we're looking at what we call call-centre service. So we don't have it on-premise anymore. It's an internet based call centre system. Obviously we do all the proper stuff to make sure we choose the right partner, this integrates with Salesforce totally. So wherever you are, my function is to make sure that if the telephone … so if you use a soft phone for instance, once again, a back office system. So on the guys phone, as he travels around when it pops up, he will know exactly who this customer is, what complaints he had the last time – everything on his mobile device. And that is where integration is key. So whatever I'm doing, I'm supporting customer]. Okay, but I give them all the systems with the relevant data to support a salesperson, a support person, and indeed, whatever. So anytime he's got the best knowledge in his hand that integrates the back office systems. So he doesn't need to figure out, "Shit, who's this client?"

Interviewer: He can make informed decisions.

Respondent: Exactly. But also, we build in intelligence in the background to sift through things already and this is where the big data thing comes in, to make sure that when this mes comes through to the salesperson that he's got more than that. So then you look at customer for life. But also, customer for life means that we need to know if this customer has outgrown his existing system. So he's using our system, but it could be that there are other systems within our portfolio that can offer more to this client. And there's this, you know, we call up-sell, cross-sell opportunity. So this client's been with us for years, but you know what, we've got so many other different products, some modules, some functionality that immediately the salesperson will come up and will have some intelligence to say, you know what, this customer has grown from having 20 employees to 200 and he's still happy with his product, but you know what, we've got better functionality in other products. And this is where the cross-sell and up-sell opportunity comes in. So this is to add value to the company. It puts systems in place that will

intelligently assist whoever to actually make better choices for the client. So this is where this whole good comes in.

Interviewer: It's actually value adding.

Respondent: Huge value adding. In fact, they're so dependant on our systems. There's, I mean, this country alone, I mean, we've got hundreds of thousands of companies, just in Africa using our systems. So you need to build in systems … you can't take a person with a spreadsheet to try and figure out where this person is. So everything is being done on systems that's being fully integrated with everything else that supports the business to do better. Well, that supports the client to do better. So it's crucial and critical that we've got those things in place.

Interviewer: What would you say are the challenges facing integration of management systems?

Respondent: Well, I've got unique issues, and the issues are that in my region we're all over the show. So, challenges are definitely, I would say, legacy systems. Getting rid of legacy systems, that people used to work on for multiple years.

Interviewer: So legacy systems as in?

Respondent: As I said, we've got nine different … till three weeks ago we had nine different companies in Africa. All those companies had their own systems that worked for them and they just, you know … So I would say that's definitely an issue on our side. And then things like mobility is a big thing for us. Our consultants travel all over Africa all the time, to make sure that, you know, to allow them to have continuous access to all the information that's …

Interviewer: Would you think that because you are so diverse in Africa, that maybe culture can also be one?

Respondent: Well, not just in Africa, in the region. So look, if you're just going to Australia, the culture there is totally different. Culture is a big, big thing. Big, big, big, thing. But I'd say from an adoption point of view. So if you bring, so the culture's got a dynamic impact on the adoption on that. So if your employees don't adopt – embrace – the new technology and they're used to their own things, then that system won't work. You can bring the best system in, but if you can't change their mindsets to do things better, and to do things better on the new technology, it's not going to work, and they can still fall back on that. So culture's a big thing.

Interviewer: So, how do you manage that? Because clearly it's a challenge that one faces.

Respondent: I would say, training. But not just system training. So you need to change your mindset.

Interviewer: Mindset? So does that come from leadership? If you have a high performance leadership and then that's … That's how it normally …

Respondent: Ultimately it will be leadership, but it's …

Interviewer: Leadership, culture, management?

Respondent: It's difficult. If I had an answer I would have said we wouldn't be in this position. So, I think a leadership can only go so far. You can over complicate it by – I'm talking about top leadership. So, if our MD or CEO globally, he's got a meeting every second week. Okay, now in the beginning he would have embraced it, and even saying whatever, now, people don't even listen to him/them I think the biggest thing, in my opinion, is that IT … it's a big issue here, and I'll explain it. So, if you look at the major companies out there, the CIO is not sitting on the board. That's a big, big thing, okay. In listed companies. The CIO in most cases reports to the CFO. Okay, on the board. So if you look at the board, you'll have a CFO, you'll have a CTO, which focuses on products …

Interviewer: CTO?

Respondent: Chief technology officer. You'll have your CEO and even CMO – chief marketing officer. But CIO is hardly ever represented at board level. So where the problem comes in, and this is going around now, but where the problem comes in, is that in most cases IT, which this is IT, is managed as a cost centre. As a cost centre. Not as an angle of the business and that's a biggest problem. So, coming back to what can resolve that, if the

exposure, or if the person, if the CIO is seen as part of the board, okay, and whatever decisions are made by the CEO, seen at that level, then I would say, they'll embrace it way better. But because they see it as a cost centre. Okay, so in other words, the moment you report to CFO, they don't see it as a business. They don't want to spend money on you, okay. Which means that they don't really trust from a CFO perspective. Because they think that the CFOs made the decision and in most cases he has. That's the biggest problem, if it makes sense.

Interviewer: Sure, absolutely and I can really align to that what you are saying.

Respondent: It's a big, big thing.

Interviewer: If I can make a suggestion, would it be okay if I could come here for a week, and just look at what types of management systems, how you run your back office, the type of management systems that you?

Respondent: You can do that, but it's going to … the resources are all spread. So, no, no. I think it will be possible, but then we need to coordinate it properly. The guys don't have time, trust me.

Interviewer: Is it?

Respondent: So we'll need to find time.

Interviewer: It will just be a work study. It won't be … Just a background and I'll work in the background. It's not about telling … Obviously you'll get a report at the end. Just to find what theories, what you guys are actually doing, identifying the gap.

Respondent: Ja. Okay, we can work on it and see if it's possible. Obviously I need to get clearance.

Interviewer: Ja, no. Absolutely. Would you be able to give permission to be acknowledged in the thesis?

Respondent: Ja, well, I need to get clearance on that. Okay, because we're a listed company, I promise you …

Interviewer: More complicated.

Respondent: The process, yes.

Interviewer: But I can always say, Company A. I don't really have to say …

Respondent:

Interviewer: Yes.

Respondent: We can work on it. I just need to get clearance.

Interviewer: Clearance. No, sure. Just the last question I want to put to you. What, after this discussion here, do you think I should address that I have not covered here, in the discussion with you?

Respondent: Ja, it's actually difficult, because I mean, ja, I don't know. So, the main thing is the integration. So, it's quite important, I think, okay. No, no, I think you've covered most of it. It's just, each company will be totally different from another company. Even if you just look at one small product. Not product, ERP. You could have 20 different things that have come to you, but company will only use 18 or 5 or whatever. So the need of a company will change totally from company to company and we see it. So this is going to be very hypothetical. I don't know how you're going to split it up. So if you look at the topic that you're discussing now. How're you going to? So what type of finding do you to have in this? So what I mean by that is, because of the diversity of the companies, the diversity of systems, so how're you going to focus on it? Small, medium, large companies? Specific areas?

Interviewer: In terms of generalising the study, I'll be looking at top companies, so it means that I'll be looking at 4, 5 companies that I mentioned that are developers, and then I'll look at probably like, data. Skynet, Hellman. These are the companies that use management systems in terms of, for example, logistics. So this is what the aim's going to be, is that

you have developed something. Does it actually match what they require, or is there a certain gaps in that?

Respondent: Ja, it's going to be interesting. What you will see is that a lot of development companies in a lot of cases are not using their own products. You can't believe it, but it's true. So in North America for instance, and obviously this is confidential, but in North America using SAP in North America, now SAP is competitive, but the rest of the world are not, we're using our own products. But there are reasons for doing certain things. So we've got a product we all – our own product – X3, and that's been … and I mean, we … so I mean, we see that, because this is a bigger roll out of our own product, but we also using it as a case study. But I mean, we see issues and the issues are not the system, the issues are training the people.

Interviewer: Training?

Respondent: Ja, training. So, our products are as you know, we sell to very large companies, but one thing that we've neglected to do, is the extensive training to the employees that work on our own systems internally. And that is where the biggest problem came in. Training – not on the system per se, but new processes that's got to happen on the system. And that's a big thing. I think in most cases where the system doesn't work is because the guys don't do proper training. Exactly the question you've asked previously; internal training. There's a lot of assumptions that we make, that you can take guys that used to do similar work and just move them into a new environment …

Interviewer: But it doesn't.

Respondent: No. So, processes from a human perspective, but that's a big, big issue for us.

Interviewer: So, just to reiterate,, thank you so much for your time. I think I've exhausted all the questions that I can ask and your time is really very valuable for me, just lastly, I will submit a questionnaire to you and you will be able to assist me with that, please. Thank you so much, I really appreciate your time.

Interview **2**

Sector **Banking**

Occupation **Technical lead**

Interviewer: Good afternoon Preneshen and firstly thank for your time, and it is very valuable that you give me your input into this study. I really appreciate that we can set aside some time to do this research. Firstly can you just please give me a big overview of your organisation, yourself in terms of experience and anything else that you want to say, okay?

Respondent: Thank you, thank you very much for the opportunity Sugan, it's very appreciated, it's in line with what I basically do on a day-to-day basis so I'm currently working at Nedbank and I'm the technical lead for the development team, the SAP Development Team.

Interviewer: Oh, fantastic.

Respondent: Right, so basically you know on a normal operations basis it's support and maintenance so new changes from a new change perspective, from an incident driven perspective, we're talking about production issues and stuff like that so it's a complete support team that we're basically working with.

Interviewer: Okay, fantastic, and how long at Nedbank?

Respondent: I'm with Nedbank for about a year okay, but my SAP expertise, my experience is about twelve years.

Interviewer: Twelve years?

Respondent: Yes, twelve years now.

Interviewer: Okay, fantastic. So I have a set of predetermined questions which we will go through and then you can just answer them for me.

Respondent: Perfect.

Interviewer: How would you define a system? In fact I'm going to ask you three types of questions, how do you define a system? How do you define a management system? And how do you define integration? So there's no right or wrong answer, it's what is your perception.

Respondent: So in essence, my definition a system would be, well a whole host of business processes that have been translated into progamattical requirements that have been put together to obviously achieve the goal of an organisation, that's basically what a system would be.

Interviewer: And an integrated system?

Respondent: So integrated systems we're talking about like third parties, third party solution systems and stuff like that. Basically if there's a need, like for instance in Nedbank, there's a need for the current legacy, the bank systems to communicate within SAP. So in essence we have the SAP FI system, a SAP system which basically there's a need for bank transactions to basically post to FI. So that would be the integration points because the legacy system obviously being like a third party system to SAP and ja that's the integrated solutions basically with what we talk about.

Interviewer: And the type of management systems that you work with now?

Respondent: So we've got SAP and we've got the ERP solution, we've got ECC6 ...

Interviewer: ERP solution?

Respondent: Enteprise and Resource Planning so that's the FI system on its own. So you have your material management, your sales and distribution, you'll have your travel - travel management ...

Interviewer: HR?

Respondent: HR is ECC system ...

Interviewer: ECC?

Respondent: Ja so, it's actually, ECC is actually the level of the system so we call it ECC6, it used to be I think ECC5.4 or whatever so that's the level. I think it's Enterprise Community … I'm not a 100% sure but we'll get there. Sorry, my understanding of the abbreviation, some of it is not that great. But that's the level that we're currently on; a ECC6 system with HCM, we have an HCM institution.

Interviewer: HCM?

Respondent: Human Capital Management. So HCM is, previously known as Human Resources but because of the whole transformation in terms of your employees becoming assets SAP has evolved HR to Human Capital Management.

Interviewer: So you say that there's ERP ...

Respondent: Yes, so SAP ERP that's your F file, your MM, SD, travel, all that ERP.

Interviewer: Okay, so you say SAP at the top and all the branches of the module ...

Respondent: So we have two different systems, two different boxes, right. So as I said the ERP box contains, so when I say box it's the one system, the one server, SAP server contains FI, travel management, materials management and stuff like that and then we've got a separate SAP HCM box ...

Interviewer: and that's for ...

Respondent: system ...

Interviewer: and that's for, purely for HR?

Respondent: Correct, for the employees of Nedbank basically.

Interviewer: Do these two, do you say SAP and HCM, do they talk to each other or is it?

Respondent: So SAP, HCM SAP it is SAP, so remember to an extent yes, remember HCM and SAP F file so your ERP and HCM, they have to talk to each other because what happens is typically from an imperial perspective, employees get paid but those transactions need to be posted in your ledgers and your journals and whatever one your F file so there's integration between those systems as well.

Interviewer: So integrated systems have to talk to one other?

Respondent: Absolutely. So there's something called IDOCS and ALE, those two are the communication mediums for internal systems so SAP can talk to each other like that, with IDOCS and ALEs. So they basically send data across at real time. So the moment an employee gets updated as well so there's reliance as well because what happens, so we've got Travel Management as well, so with Travel Management there's a need for an employee to be created as a business partner so that process - I'm not a hundred percent certain of that process but there's a need for that business partner to be created. And when that gets created - but it gets created on the finance box. So remember when an employee gets created from HCM then the ALE runs immediately when the employees is created, it runs, it pushes data.

Interviewer: ALE?

Respondent: Not a hundred percent sure. But it's basically, as I said it's the communication medium in between – it's a standard communication medium that's between SAP systems. You can integrate these systems. And there's RFCs, so let me tell you RFCs, they're remote, so they call it remote function communication calls, remote function calls. So what happens is you're basically talking to each system, okay right, so as I said the employee gets created, the moment the employee gets created it triggers off these ALEs via standard configuration to push this data across to the financial system. You see that? So there's like a mini master they call it, HR mini master that resides within - not all of the HR data, but only what's necessary for Travel Management for instance.

Interviewer: Okay. Once you have implemented a new system that is required by the organisation, what happens next?

Respondent: So basically I think what happens is we go into post implementation phase, and that becomes more or less what we call our fire-fighting phase because remember

sometimes in a lot of organisations what happens is you know if they don't adopt the top-down approach, meaning align your business processes before you start designing and developing, then you basically have sort of have repercussions, because now remember the organisations actually always align their business processes first before they actually design their systems.

Interviewer: So what you're saying, they must standardise or?

Respondent: Correct. So standardising is very important as I say so in terms of your business processes they should be aligned first because that's operational level, right? And then your system should be built when you standardise your business processes because then you can adapt as well. And that also eliminates risk, because like for instance, I'll use an example, your leave process: So if you're applying for leave for instance and there's a requirement for three level approval or whatever, or you know if there's a, if leave goes into negative and there's special approval that's required for instance, you know those are the sort of things that require it to be bedded down at a business process level if you actually adapt to the system.

Interviewer: Okay, that makes sense. So in your view, in your organisation, what would you do first, would you integrate all your systems and then standardise them? And probably there's three levels, the level would be at your leadership level which is corporate level at a business level and operations level. So how do you, where would you find a integration, standardisation, and a combination?

Respondent: So we have a team of architects, solution architects lright, within, well they're actually solution architects with, that overview on all the banks system, so it's not necessarily a SAPS solution.

Interviewer: And architects there are?

Respondent: So they basically bring all these systems together, in other words from an overview perspective. So in essence like SAP and all the third parties and stuff like that, I'm talking about, so SAP is about one bit of the bank systems that I'm talking about so there's lots of other systems, there's something called Ariba, I'm not a hundred percent sure what Ariba is, it is an analytical system so I think Ariba is actually an analytical system so it's used for analytics. So for business to draw up like forecastings in ...

Interviewer: making informed decisions.

Respondent: making informed decisions. So in essence they ...

Interviewer: So a management system then?

Respondent: Yes, Ariba is also a management system. So what I'm saying is like these guys have an overview of what the landscape should look like. So in essence I believe that standardisation should always come first for me, personally ...

Interviewer: At which level?

Respondent: I think from an architectural level ...

Interviewer: so that's?

Respondent: Strategic level, management level, I think that needs to be bedded down.

Interviewer: So you have strategic, management and operations. So at which level, you say strategic at the top.

Respondent: I think strategic level.

Interviewer: So at the top.

Respondent: Definitely

Interviewer: So you think standardisation should be at the top?

Respondent: At the top.

Interviewer: And integration?

Respondent: So integration would fall ... So in terms of obviously designing, you know, I mean, understanding integration or how the systems would communicate but also should be at a strategic level but in terms of actually getting the work done I think that's right at the bottom, operations level.

Interviewer: So would you integrate there or?

Respondent: What do you mean, actually get the stuff done?

Interviewer: With your reporting system. Would you want to integrate there or standardise there?

Respondent: You're talking about operations level?

Interviewer: Operations level, ja.

Respondent: So from an actual work perspective I'm getting it done, I'm integrating the solutions, yes it gets done. So I would assume, I would say that everything, all these, even standardisation would cover through each process, through each level that you're talking about. Because remember even from an operation level for you and for us developers, we've got a design phase as well, so we can't say “okay fine, the architect does designing, the overview like this” and we just go ahead and do it, we've also got to do an analysis, conduct an analysis on ...

Interviewer: A needs analysis?

Respondent: Sorry?

Interviewer: Is it a needs analysis?

Respondent: So in essence yes, his ability, so in essence how, whether this will actually impose risk to the organisation you know, we have to ...

Interviewer: Is there risk? What type of risk?

Respondent: Like in terms of like, we also need to understand the sort of security that needs to be implemented.

Interviewer: So use this type of standard, or?

Respondent: So in essence, typically what happens like for, okay for success, we got a success factor solution, that's a cloud solution, an HTM solution right, now typically what has happened is, we actually upsert data, so we send data from on-premise, we call it on-prem, so from SAP HCM to success factors. Now remember because we're sending data and we also have downstream of data coming from success factors to HCM, that means there's a point of entry. So typically we’d get like a team of hackers to basically have access to success factors, right, and we try to see if they can actually intercept or get into our bank systems. So that's all part of the IA – the Impact Analysis that webasically conduct and we need to see that this thing is solid basically.

Interviewer: You use any type of standard like the ISO 27001 which is a security standard?

Respondent: I'm not very ...

Interviewer: Okay that's fine.

Respondent: Those are college days stuff.

Interviewer: Discuss the policy of integration in your company.

Respondent: So I'm not very clear on the policy ...

Interviewer: But do you know, do you have a policy.

Respondent: I'm sure we do. I would need to obviously acquire that information for you at a later stage if possible.

Interviewer: But do you, you not sure whether you?

Respondent: No. So from a development perspective where I stand I fit in, I'm not … I use integration because obviously some of the stuff that I develop requires integration because I'm passing data through to other systems. We're talking to each other but I'm but one portion of this. So in essence we have middle way like they call it process integration

PI, SAP has a standard integration tool right. We also use PI by the way for success factors solution.

Interviewer: Process integration.

Respondent: Correct; process integration.

Interviewer: What is process integration?

Respondent: So it's a middle wetu, so in essence what it does is, so we would, so for instance if you've got employee data to upsert to SF - to success factors, so we call it SF, right, so you've got employee data, what we do is we have a programme that basically runs on our HCM system, that programme triggers off a service, a PI service, that PI service actually acquires this information in XML document and it pushes it through to SF. So in essence our programme some of it will trigger, it will trigger the PI job, the process Integration job and it will immediately send it off to SF, some of what we do is we land our information in a folder structure, so we call it the application server on SAP, we land the information there and then what PI does, Process Integration, they go and pole the location, so they keep on checking, they keep on checking and then when there's data there they'll pick it up and they'll send it off. So there's different way that we basically utilise PI and data integration between the systems.

Interviewer: Fantastic. To what extent would you say that the management systems that we spoke about, we spoke about SAP and we spoke about Legacy as well and HCM, to what extent, when I say extent you can say maybe 100%, maybe 75% are these management systems integrated?

Respondent: So, remember SAP as a whole is an integrated solution. I mean SAP in all its entirety, that's what it brags, it brags the fact that it's seamless integration, so the fact that your payroll goes off on HCM but it gets posted on FI, via journal is almost seamless. To the employee it becomes a … to the user it becomes a nightmare because there's lots of processes that's involved to get it done so, but what I'm saying is, to management and to Nedbank's goals it's a beautiful system. Because there's no need for now extracting data like from an HCM system, extracting it into an Excel document then uploading it to another system again and getting the postings done. It happens ...

Interviewer: seamlessly

Respondent: Ja, at real time.

Interviewer: Fantastic, so what you're saying that is ...

Respondent: I'm saying we've got about, I would say our management systems are about 75% integrated. I'm not a hundred percent sure whether everything is you know, on board. Because I do believe that we have core banking, core banking is like now all your ATM transactions and stuff like that which still resides on its own. So we still need to get there I guess in terms of integrating those solutions to our finance boxing and stuff like that.

Interviewer: Okay. So obviously the integration process will come from the architects, you said architects have an overview.

Respondent: Correct, so they have a blueprint, or they have, they also do like forecasting in terms of you know trends and stuff like that and where do they want to go in terms of technology for the bank so those guys have a clear picture or you know of what they want for the future.

Interviewer: Is that a strategic level?

Respondent: It's very strategic, it's definitely at an exec level because the guy that I communicate with, his name is Mikel I can't remember his surname right now, but he's an executive for, he's an integrations executive, he's an architecture executive, so he's operating on an executive level.

Interviewer: What were the role of senior top management regarding integration of management systems?

Respondent: So senior management would basically interact with the likes of your architects and stuff like that and try to understand you know how we're going to fit everything together.

Remember, our senior management's sole purpose is for SAP, so they need a continuous upstream and downstream of information regardless of what system it is, so we have our own goal you know so we just want to make it happen in other words. So they would interact with the architects to basically understand, you know how we're going to get this achieved and then obviously the communication methods, you know like now I'm talking of PI is one of them. So they could use many other integrated solutions like there's business connector, there's lots of other middleware tools that you could use basically. So ja it's very important for senior management to be much as part of the strategic level ...

Interviewer: involved.

Respondent: involvement basically.

Interviewer: How would you describe the processes of managing the integration or combination or standardisation of new systems and / or amendments into the organisation? How would you describe this process of managing?

Respondent: So for amendments in specific right, so we have a change management process then ...

Interviewer: The change management, is that at a strategic level and it's filtered through?

Respondent: So remember, yes it has to be also at a strategic level because remember there's risk there; so every time there's a change there that basically impacts your production environment you're imposing risk on to the organisation. So we've got something called a CAB - a Change Advisory Board where a group of maybe business level people or execs, even part of the technical team - so all of the high level people - so in essence, for instance, for technical expertise, I would be a part of the CAB because I would understand what my developers have been busy with and I have to be involved with the CAB because I would tell businesses to whether the level of impact as specific change is going to basically do and I need to motivate that change through the landscape. So in terms of that, that's the process basically what happens. So typically what will happen is, business will have a requirement, they generally provide this via BRS, Business Requirement Specification, okay, and they will obviously table that with a change advisory board, that gets approved and then only when that gets approved then it should get pushed down to the relevant team, so in out case it's SAP, so we have a bunch of function specialists, so they are, I would call them the custodians of the system because they actually understand in their space so we have function consultants in HCM, for instance. Now HCM is broken down into payroll, into organisational management, into personal administration, into talent management, there's a whole host of stuff that reside within HCM. So we've got specialists in each area, there's some of them obviously, you know one person would basically do multiple roles like sort of handle that. So those guys basically understand what SAP can actually do for the business ...

Interviewer: deliver.

Respondent: So in essence business will come with that requirement. But they need to sort of translate that requirement to SAP language. So in essence one that requirement is translated we call it a functional development specification okay, and then only will the development take place. So from a configuration perspective you'll find that the functional guys do the configuration, from a technical perspective that function still gets pushed down to the development team which is my area, okay, and then we actually do custom to retrofit the organisation. So in essence SAP has a standard delivery, they will give you what you require to run an organisation, but no organisation is the same, business processes are all different, different levels of approvals and all that stuff. So we've got to retrofit that business requirement to suit Nedbank's purposes basically.

Interviewer: Very nice. Thanks for that.

Respondent: Cool.

Interviewer: What would you say the challenges of facing integration management systems in an organisation?

Respondent: So I think challenges would be, you know people are generally challenges, you know there's always lack of certain knowledge. Training budgets you know, you need your people to train in order to and then you know in order to support the system, but obviously you know that comes with its price as well because remember the organisation loses money whenever they train, although they do try to get some back but those are some of the challenges right. And then obviously you know poor design sometimes, bad … like working from the bottom up rather than top-down. So in essence my chat to you about getting the business requirement, or the business process in line first before you come down to your system. So in essence if you build your system first and then try to align your business processes sometimes you find that you're actually contradicting other processes within the organisation. That's the risk that you actually face when you don't work from the top coming down.

Interviewer: So you say that when you are working from the top and coming down, so the things that you should consider, you said that the change factor.

Respondent: Correct, absolutely.

Interviewer: You said something about training as well.

Respondent: Absolutely, that's part of change management.

Interviewer: Is there any other thing that may impact on management systems, integration?

Respondent: So also when I speak of training as well, you've also got to look at from a user perspective. So in essence you're implementing this new system, you might just need people to be trained to use the system as well so that's also a very big challenge in an organisation I've found. Where people have this beautiful system but it is difficult to use, so in essence there's training required there as well.

Interviewer: How do you adjust this challenges?

Respondent: So in essence, you know this should fall as part of the change management process right, purely because training should be part of the budget - the project budget. So in essence what I'm saying is if you implement a system right, that's new to the organisation, you need to obviously fit that training cost within that budget.

Interviewer: I can just in rounding up the conversation that we had, from the discussion that has taken place and the questions that I've posed to you, going forward, do you think being the title of my research being a framework for the integration of management systems in an organisation. What would you suggest I consider asking other participants that I could have left out?

Respondent: You could have left out, look Sugan, I think you pretty much covered a lot, I must be honest. I think ja, look, I must be honest you covered pretty much everything, in fact I don't know whether I spoke too much. But in terms of I think, ja it's basically …

Interviewer: From a strategic point because you are the interface of management and leadership, do you think that leadership need to do any more at the operation level, they need to do more in terms of integration of management systems?

Respondent: So from a leadership perspective you know I think that's where, that's where you know as you said, strategic decisions are made, right, so in essence you know risk, elimination of risk in terms of that integration process, that is imperative during that phase. I think that's where you know senior management basically they need to focus on that area so ...

Interviewer: risk elimination.

Respondent: risk elimination.

Interviewer: What about policy?

Respondent: So policies will also filter to your business processes right, so remember depending on what's required from a business perspective that's how your policies also get aligned.

Interviewer: They are filtered through there?

Respondent: Correct, they are filtered through that basically.

Interviewer: Mr Govender, thank you so much, I really appreciate your time and for making time for this interview, it's much appreciated.

Respondent: I thank you for the opportunity Sugan. I appreciate it.

Interview **3**

Sector **Government**

Occupation **Senior SAP Specialist (Integration)**

Interviewer: Hello, thank you very much for affording me the opportunity to interview you, I really appreciate your time that you sacrificed for my study. Firstly, just give me your name and your surname, your current position, how long you've been in your position, your work experience and we'll take it from there.

Respondent: Okay, perfect. Thanks for the opportunity. My name is, I'm currently working at, I've been there for the last four years, in the IT space, we've been doing SAP development. Previous to that I was at Telkom or twelve years, also in SAP development. I've been in IT now for a total of sixteen years, ja.

Interviewer: Great stuff. So what are you doing at ?

Respondent: I'm part of the – okay – I'm a senior specialist, part of the SAP team, we're responsible for the management of the SAP system at. From the technical aspect, our core function is development integration. We interact with our business consultants and they interact with the super users. So, that's our function currently, so we're managing the ERP SAP system at.

Interviewer: ERP and super users? We'll discuss that more as we go, fantastic. Thank you so much again. I want to ask you three questions here, and the first one would be: how would you define a system? How would you define a management system? And how would you define an integrated system? There's no right or wrong answer, it's just your perception. So firstly, how would you define a system?

Respondent: A system in general terms is any form of control. So you have a system whether it's inside, outside, work, wherever. A system is a list of components and how to do certain things. That's what a system is.

Interviewer: Fantastic.

Respondent: A management system, you can take it closer to home – it's more on how we would – if I had to use the word manage again, it's the management of people, it's the management of resources. It's how processes are run within an organisation. So a management system will be a series of systems, or different systems, you can even put them together, you call it an integrated system.

Interviewer: So what is an integrated system?

Respondent: So an integrated system will be when the various components of your systems talk to each other. So the matter of passing information from one system to the other ultimately to form one integrated system in an organisation. So we take an organisation like, we have various front end systems, we have people sitting on the board, we have people sitting everywhere so they – that's our front end system. A customer comes to the branch, they interact with our front end system. So we have a system to manage a customer there. When the customer leaves, their information is passed onto the other back end systems which are more supporting systems by means of integrated. So an integration system is to pull all those systems together and be sure the data flows from one to the other – that's integration.

Interviewer: Okay, fantastic. Short and sweet, huh?

Respondent: Short and sweet.

Interviewer: Discuss the type of management systems you have in your organisation and please provide some examples.

Respondent: Our main management system to manage our total finance will be SAP. Whatever finance flows within, will flow via the SAP system. So that's our main ERP system. SAP is responsible for our finance. chartered accounts; that we regard as our revenue accounting systems. SAP is also responsible for our internal systems, which is our people. That is our human resources systems. That's our own accounting systems, so we run on two different company codes. So that's our main systems. We also have

custom systems, which are responsible for every time something leaves or enters our country. So that's our inter-front system.

Interviewer: So basically what you're saying, there's two systems, there's a SAP system …

Respondent: SAP system is our main back end system.

Interviewer: And the front end system?

Respondent: Front end systems, if we're talking about individuals, from the individual point of view, it would be. If we're talking about border control or customs, it will be Interfront.

Interviewer: Interfront. So you have three systems, is that what you're saying? Three management systems?

Respondent: Ja. You can say.

Interviewer: Three management systems, okay. So you have a back end, front end.

Respondent: Ja, we have a back end system, which is SAP, where ultimately everything will feed into SAP. All data will process there. We have a front end system based on tax type – either the customer or border control or business, that's our front end systems and we have an ESB system, which is our enterprise service bus, which is our main integration component.

Interviewer: Okay. Can you just give me a little more information on that?

Respondent: Our main integration component like every company is our ESB. They're responsible for transferring one set of data from one system to the other. So, if at any point in the organisation where we need to move data, we interact with our ESB. So data will flow from either in or out of the SAP system to our ESB system – ESB being our integration and they will forward that message via queues to whichever front end system. So that's how it works.

Interviewer: Fantastic, thank you so much. Describe how would you work with multiple systems in your organisation?

Respondent: Work with multiple systems, I think each functional unit, or each specialist within the system will manage their system. The moment that system needs to interact with …

Interviewer: Can you give me an example?

Respondent: For example, SAP. The SAP specialist together with the business specialist, function special development is managing SAP. Anyone needs information to SAP, or from SAP will contact those resources. Those resources will determine what data is needed and they will interact with the next system. So did I answer your question? Is that what you wanted?

Interviewer: Ja, that's fine. Discuss how you work with the multiple systems?

Respondent: The multiple systems. So, the important aspect is integration. Integration needs to document all the data flow within the organisation. So if anytime you want to know where is this data coming from or going to, your integration team will tell you that. They will manage data via schemas. Each schema will be linked to a process and that will tell you your data flow. So there are data flows.

Interviewer: Fantastic. Once you have a new system that is required by the organisation, what happens next?

Respondent: So I take it from a point that you say a new system in that it's already been decided this new system is approved.

Interviewer: Yes.

Respondent: Or is it a case where the system is still talked about? We haven't decided on the actual vendor to use for the system?

Interviewer: No, it's a new system coming into the organisation.

Respondent: New system coming into the organisation. Okay, so …

Interviewer: What I'm saying, it's approved at strategic level and it needs to be rolled out.

Respondent: Okay, so at the strategic level and higher level we will probably say for example, when we implemented SAP. They would say, okay, we are going to use SAP as our main integration system. And that's what we're currently doing. We're moving now all our core text systems onto SAP. So if that's our new system, the main thing to do is to first document your whole system – to understand what your whole system is doing, what it requires, and then you need to document what the new system needs to do. So you need to map that process that you're currently doing, to the new system, so that you don't lose functionality, but you can also get rid of redundant functionality, but also implement new functionality with new features. So, the initial stage is very important.

Interviewer: Great stuff. what is your view on integration, standardisation, or combination? Do you? What is your view on integration?

Respondent: My view on integration, I think integration is a very important aspect. I think integration needs to be centralised. You cannot have systems talking to each other directly, because then it creates the problem of, you don't know your interfaces in the system, in the company, especially in large corporates - you don't know your data flow. So if you have one central component as responsible only for integration, you know your data flow within the organisation. Most systems want to just connect with each another via RFC or a direct call or web service, then you don't know who's talking to who and where the data is coming from. So my personal view is integration must be centralised and it must be standardised. So, we must have a standard on how we interact because if you don't have a standard then anyone can just call any service for you anywhere and it creates security threats. You don't know where your da …

Interviewer: It's a risk.

Respondent: It's a big risk. So at least if you have an ESB system, they are monitoring …

Interviewer: ESB?

Respondent: Oh, a central bus. You know, it's an Enterprise Service Bus. So generally an Enterprise Service Bus is one main channel, for communication with[in] an organisation, all systems communicate with them via various adaptors. So it must be centralised, it must be standardised.

Interviewer: So, would you say first you integrate and then you standardise? Or you standardise first and then you integrate?

Respondent: No, you must have standards so that anyone who wants to pass data, they will follow those standards. Those standards can compromise like, for example, a header, your body and your footer, so that we know where the information is coming from, what type of information, where's it going to? And you must also have like a reconciliation to say, this is the amount of data that I passed to my integration engine and this is the amount of data I received, to ensure that you're sending and receiving the same amount of data. So there's no data lost within an organisation. So integration is very important to have a standard, everyone follows a standard. Otherwise, at any given time, you won't know where your data is and someone … if an interface is down, you will not know if it's not standardised. So at least you know where to look and it also shows continuity in organisation.

Interviewer: Business continuity.

Respondent: Business continuity, because if we have a standard and you leave, the next person coming will follow the same standard. The standard's easy to have a full birds-eye view of integration. It must be standardised.

Interviewer: So, just so that I can understand now, right? You integrate first and then you standardise? Or you standardise? Because you are talking at an operational level, you're not talking about a management level or at a strategic level. You're talking at an operational level, so what you're saying?

Respondent: At a higher level, at a strategic level, we must have a standard to say …

Interviewer: So standardise?

Respondent: Ja, we must standardise to say, if we're communicating to SAP system, we communicate via integration method will be via IDoc. Or our integration method will be via an OData server, or web service. So that standard must be set up front. So anyone knows, when we're talking to SAP, or when we're talking to any system, this is the standard we follow, because if you don't standardise then I will say, I don't need to come and do your integration, I can come and do a general RFC connection and no-one will know in the organisation what's the RFC, I can create a user and I can pass data …

Interviewer: RFC?

Respondent: Remote Functional Cord. So it's important to have a standard of how you're going to do it. So set the standard and then everyone follows the standard and then implement that going on.

Interviewer: So where does integration come in then? At the operational level?

Respondent: Every organisation must have an integration strategy. So that will be set up front. And then on operational level, as soon as data needs to be passed within an organisation, that's when integration comes in – at that point.

Interviewer: So you say they need an integration policy, I'm sure has already has an integration policy, and everybody knows that integration policy, so integration is throughout the organisation?

Respondent: Throughout the organisation. Every system integrates.

Interviewer: So at a strategic level, integration policy, from what you've been saying, and then you standardise there, according to your standards. What type of standardisation do you do?

Respondent: In terms of our standards for integration, we have a schemas. So we say, this is a schema that every system needs to follow …

Interviewer: Schema?

Respondent: Schema will be something to tell you the type of protocol that we're going to use to communicate. It must be, for example, HTML. If it's HTML, this is the format that you need to follow. This is what you need …

Interviewer: So it's a document.

Respondent: It's a document. It's documented and we have schema valuations to ensure the document is followed. So at a strategic level you will determine like things, for example, your protocols, your type of interfaces where synchronised.

Interviewer: Policy.

Respondent: Where's your policy. We need to say for example, our lead time for data to pass from the front into the back must be three seconds, or two seconds. If it's not, two seconds, we need to escalate something. So those things must be set in a policy, so you're know how long your customer is standing in front and waiting for reply. So you must have, those things must come from a standard from strategic level, because if you don't have lead times and you don't … an interface can't just run forever. You know, you must have type of calls, protocalls, policy. Policy drives everything in integration.

Interviewer: While we are on policy, can you describe this policy on integration in your company?

Respondent: Ja, not giving away too much, but our policy for every system will determine the type of communication. Your lead times, what happens in the high peak seasons, low peak seasons, what happ … it's 24/7. Your maintenance calls, your standby, all of that comes from the policy. How we want to run the organisation in terms of integration.

Interviewer: Fantastic, right.

Respondent: So we can't just go to you and say we want to talk to that system, because we must go to the policy, if I want to talk to that system, what are the guidelines I need to follow?

Interviewer: And that comes from policy?

Respondent: Policy. You've got a reference.

Interviewer: Integration policy.

Respondent: Integration policy. Because now on the market there's too many integration protocols. There's too many adaptors. So you can connect to other systems various. So the policy will determine the one standard that you can use to communicate. So, when the integration hub needs to be upgraded, you don't need to go and test against everything. You already know by your policy what we implement ed. So if I upgrade and I test that policy, everything will work because you have a policy to say how I integrate.

Interviewer: What if something goes wrong and it's not in the policy?

Respondent: Oh, you will have variations, but that will be picked up way ahead because we're developing environments, QA environments, pre-production environments, before it even gets to production, you'll be tested four times in four different systems, so it will come out.

Interviewer: Come out, fantastic. What are the role of senior or top management regarding management of these systems?

Respondent: The role of senior management or top management is very important in the management of systems because they have to ensure that the system meets all the standards for example. For example, now needs to be GAAP compliant, which is an international standard …

Interviewer: GAAP?

Respondent: GAAP. Which is the general accounting accepted principles. So we need to be GAAP compliant across all systems. So management needs to ensure those compliances are met by legislation. So they need to ensure their systems are up to date, their systems can manage those policy changes. Every year policies change and with as well, legislation changes every year, so they need to ensure that the systems are flexible and adaptable enough to implement those changes. A lot of our policies are driven by government, so you know, they need to ensure that. Our systems need to be robust. is a 24/7 business, whether it's weekend – anytime. So it needs to be running all the time. Our systems need to be adaptable, we need to have proper fallouts controls, integration policies, upgrade meeting cycles, so a 24/7 business. So that's their responsibility. They need to ensure as well continuity. So they need to manage it from a people's point of view, from a vendors point of view.

Interviewer: Fantastic. Thank you so much for that information. How would you describe the process of managing integration or standardisation of new systems coming into the organisation?

Respondent: The process of managing integration for a new system?

Interviewer: For a new system or an amended system that is in the organisation?

Respondent: Well, the first thing is, you have a system.

Interviewer: And if you have a new system …

Respondent: Yes. Let's say you got a new system. The important thing you need to understand, if you're going to integrate other systems, what information do you want to pass. Based on that, you need to see, what does my current system, what mechanism does it allow for integration? So every system that comes in from a new system on an old system will have mechanisms for integration. So it will tell you, I can integrate using either HTTP or HTML protocol, or I can use a remote function core, or I can use IDocs or I can use web services. So you've got to understand first what are their integration capabilities. Then your ESB will see, okay, the new system can integrate in four possible ways. Our preferred way is XML. Transmission via web service. So that's how you will analyze how we are going to talk to each other. So you identified what data are you going to pass.

Interviewer: You say talk to each other – integrate?

Respondent: Integrate. So you've got to identify what data you want to integrate with, and what means of integration we allow, and whether the new system can or should – well, it should always follow the standards that have been put in.

Interviewer: You're talking about policy?

Respondent: Policy. For the integration, so once these three things have been met, that's all we need, then we can integrate data.

Interviewer: What would you say the challenges are facing integration of management systems?

Respondent: Well, the biggest challenges facing integration now is … well, there's many aspects of it. One of the challenges is standardisation, because each system comes up with their own way of integrating, so we need to be sure that our integration engine can handle all the various ways of integration. To ensure that our integration engine is always up to date. We also need to ensure that the type of communication – there's no delay in our integration. We'll integrate, if you have a customer standing at the front end and he pressed the button, or if you log onto e-filing and you submit, you can't be hanging. You can't be scrolling. That information needs to flow through the organisation quick and fast. So that's the biggest challenge to make sure …

Interviewer: So when you're saying quick and fast, are you talking about efficiency?

Respondent: Efficiency. Your data flow from the customer to the back end system to go back to give him a reply to say, yes, I processed your request needs to be quick. The lead times need to be quick. So we have to ensure integration is online 24/7. You must have a fall-out if the system is down, if the network is down, you must be able to switch over to a disaster recovery site, or switch over … So we have duel system running. So we can, if one goes down we can quickly switch over to the other to ensure continuity. So those are the challenges.

Interviewer: Looking from a technical point of view, you said that there's efficiency – you said something about standardisation.

Respondent: Standardisation, ja.

Interviewer: From a people, because people are working with this, right? So is there any challenges, both internally and externally?

Respondent: Externally you got to be sure that you've got vendor support, because when you implement complex systems, and they are backed by the vendor, you've got to ensure that the vendor is always available if need be. So you must have a policy with them to say, "If we raise a call with you guys, you need to respond within 5 minutes, 10 minutes". You need to ensure our lead times for continuity, that's importantly.

Interviewer: So lead time. Lead time?

Respondent: Ja, lead time.

Interviewer: So that was externally?

Respondent: Ja, that's for external vendors. For people internally you've got to ensure people are there, monitoring the systems 24/7. So you'll have a control room. You got to ensure there's a person there every day to monitor. Over and above having someone just to look if something goes down, you must be able to have channels, if something does go down, he must be able to put a team together to address the concern or the problem, within a certain time specified by your policy.

Interviewer: So what are the challenges that you might have with the people?

Respondent: People challenges are vast these days. You know, you might get a higher staff turnover. People leaving for better opportunities, or not. Also, your standard people problems – sick leave …

Interviewer: Do you experience any problems with training, culture change?

Respondent: Yes. Yes. IT's moving very fast. At a very fast pace, so it's important for guys to be well-trained and trained all the time. So that is the challenge, to keep apace of the new technologies. So yes, there's a lot of fancy technology in the market and you can

implement the technology by going forward, but to manage and maintain those technologies you need skill so it's important to retain and keep that skill. So that's a big challenge.

Interviewer: So what would you say the level of maturity of integration in your organisation? So you can say, level 1 to level 3, and level 1 being very low, level 3 being quite high, where you have documentations, standards.

Respondent: We definitely got 3. We've got documentation, standards … Ja, definitely.

Interviewer: Policy?

Respondent: Policy.

Interviewer: Skill?

Respondent: We've got the skill as well.

Interviewer: Know-how?

Respondent: Know-how. We're also backed by vendors as well.

Interviewer: Is it? So how do you make sure that you're, for example, as you said, level 3's quite high, how do you make sure that you are … because given the challenges that you face, I'm trying to see that there is a gap, because you have the high turnover, as you said, people need to be, there's a culture and a technology is changing, and you've given yourself a level 3, so how do you address these challenges, knowing that, and give yourself a 3? So how do you maintain that?

Respondent: Okay, the level why I say we are level 3, is all our integration interface is documented, we have dedicated integration team, just sitting and looking at only integration, from a technical aspect, and we've got a dedicated monitoring team that's only sitting and doing their job is only just to monitor, right? We have dedicated teams for every integration point, we have dedicated teams. For every subject matter requested has its own audit team. Interfaces are well audited, we have – what's this I'm looking for now? We have disaster recovery sites for integration as well, so to ensure 24/7 integration, if one side falls, we switch over to the next side. So we're running dual systems to ensure that integration is running all the time. We have subject matter experts in all aspects, we also got support from vendors. So your vendors are also supporting the technology. So if something that we cannot fix internally, we raise it to the vendor and they have a specific period time where they also need to fix it. So, no, we're big on integration.

Interviewer: Thank you for the information, I just want to know, given the types of questions that I posed to you, do you think that I should address any other concerns or any other part of the study that I have not discussed with you? Because you've addressed policy, you've addressed standardisation, integration, efficiency …

Respondent: Ja, I think some of the challenges within the organisation which you want, which you can also look at, is with various systems, take SAP as well, SAP system. SAP system comes with its own local bus, with its own integration engine, which is the SAP/PIPO – Process Integration / Process Orchestration. So, going forward for companies, the challenges, how much and how deep can they do process orchestration. Now, process integration is just a matter of maybe moving data from one system to the other. Process orchestration is where you're actually automating the process via integration. So if I know that I need to pass data to one system, and that system needs to trigger a task to perform another action, it must be able to do it. So, it orchestrates the process. It knows what's coming next.

Interviewer: Seamlessly.

Respondent: Seamlessly. So that's the challenge most organisations are facing. Even as well – to do process orchestration.

Interviewer: So process integration is …

Respondent: Even if you look at the manufacturing industry, the way things work in a manufacturing … You know, if you take any plant as being manufacturing on … Everything works seamlessly. Everything's automated. Now you must be able to do that with IT systems.

Now there isn't something straightforward you'll be able to do it, for … and that's a challenge, to orchestrate a full process across various systems.

Interviewer: Management systems?

Respondent: Management systems. So for example, if I know my CAAP system is used to capture leave for an employee, and my employee is sitting somewhere where he doesn't have access to the system to capture his leave, he must be able to, say, use a mobile application, capture his leave, your process integration engine in your engine must be able to capture that request, pass it to your back end system, process his leave request, send it to the manager for approval, the manager must be able to approve, and keep him update throughout the process via his mobile. So that's integration. That's integration of your management system. Managing your human resources as opposed to previously where that situation would have been, the guy would have had to come phone his manager, say I can't make it today, come in the next day, take a leave form, capture his leave, go to his manager, tell him to sign it, and file it away. That process there is reliant on the guy capturing his leave. Many guys may not capture his leave. So that's the whole thing about a management system, is to manage that process.

Interviewer: So your question would be?

Respondent: My question would be, or the challenge would be to have complete process integration amongst your various systems in the organisation. So it's about automating these processes.

Interviewer: Automation.

Respondent: Automation of manual processes.

Interviewer: Thank you so much for your time. I really appreciate your insight into the topic and the vast knowledge you have on integration. You have certainly come a long way and I can see that it's demonstrated through your knowledge. Thank you very much, I really appreciate it.

Respondent: No, thank you very much.

Interview **4**

Occupation **Managing Director**

Sector **ICT**

Interviewer: Good morning Mr, thank you very much for affording me the opportunity to interview you. I've selected you as a participant in the study regarding your background in terms of management systems integration. And firstly just give me a brief overview of your background, where you have been and how long you've been in the industry and ja we'll take it from there.

Respondent: My name is, I'm a managing director at … where I've been working since 1998, I have a background in computer science and applied maths and I spent a large part of my time in the last years helping to transform large organisations as well as governance.

Interviewer: Okay, fantastic, thank you very much. So would you say you have about 20 years experience?

Respondent: That's right.

Interviewer: In management systems. Okay, how would you define a system?

Respondent: How would I define a system?

Interviewer: Okay let me just give you some background.

Respondent: Give me a theory.

Interviewer: Okay I've been a practical. One can say that you have a digestive system, a nervous system and all these systems contribute to coming together and forming an integrated part.

Respondent: Yes.

Interviewer: So a system in terms of your body would be your nervous system, your digestive system, but how would you define a system in an organisation?

Respondent: So for me a system is many parts coming together, it's the technology, the process, the governance, the leadership all working hand in glove to achieve in a greater purpose. It's what we call systems thinking, you know where the different parts work hand in glove to achieve a bigger objective and it's not one or the other, it's all pieces working together to achieve an organisation objective.

Interviewer: Okay so that's a system. What is an integrated system?

Respondent: An integrated system in my mind is exactly putting those things together.

Interviewer: together.

Respondent: Exactly.

Interviewer: So it's all the different actors coming together. To perform a ...

Respondent: That's right, that's right.

Interviewer: A management system?

Respondent: A management system for me it's a combination of, it's actually the operating model manifested in an organisation, so the operating model is how an organisation puts the requisite capabilities together to get on with its business model strategy. So it's all the components from governance, to leadership, to culture, to behaviour, to accountabilities, to metrics, all these different components of the operating model working together to deliver the organisational intent.

Interviewer: Sure. So I think in some instance you've actually answered what is a management system? A management system is like an ERP system that allows an organisation to achieve its strategic goals.

Respondent: Sure, I guess the point about systems, is one, it could be technology and one, it's the greater components working together which is more a, almost an ecosystem, a partner

system of components, whether it's physical, processed, technology or even things like leadership.

Interviewer: Fantastic. Discuss the types of management systems that you have used in the organisation.

Respondent: Now when you say management systems are you referring to technology or are you referring to the ways of working things?

Interviewer: I think I would prefer both because it involves both leadership as you mentioned, because leadership actually at a very strategic level decide what systems should be and then at an operational, or business unit, it would be, how these systems, managements systems distil through the entire organisation.

Respondent: So is a large organisation. We have about 400 000 people globally in our organisation and we have a single way of working so a company that's very singularly focussed on driving success in the marketplace, we have a similar or standard work across the globe, so we're a large matrix organisation and we, meaning that we're structured both in terms of industry focuses as well as by capabilities. So verticals in our industries and horizontal capabilities that work hand in glove to enable these things. Now, from a management systems perspective, what's important to know in our organisation, we have a culture we call high performance delivery, and part of that culture is actually identifying very, very clearly and very simply what those clear goals are for the global organisation, those then it can cascade into all of our vertical of businesses as well as our horizontal businesses that seek to actually enable these vertical go to markets and by having it singularly focused, not only do you understand how we need to manage our global organisation for local benefit, but making sure that when do go to market, differentiated value proposition. It's that cascading of a singular strategy into a local content, it's very powerful to differentiated ourselves as an organisation in a very crowded marketplace, especially given a very competitive landscape right now. In terms or how that manifests, how do you actually promote intent at a personal level? So we've got quite an interesting evolution, and it's quite interesting that is one of the few organisations globally, it's actually scrapped its traditional performance management system. So your traditional performance management system is linked to [unclear 23:32] or the strong correlation to remuneration. We've actually completely scrapped that and replaced it with what we call a performance management system. So what we're trying to do is put a strength based culture in the organisation where we focus on creating the strengths in people as opposed to negatively criticising them for their weaknesses. And we recognise every person has their own journey within an organisation, and we see to it to identify on an individual basis a microcosm of a performance management culture that's very individual based. Every person feels loved and welcome and identify where there are errors for development and what their strengths are and we don't necessarily correlate how they get remunerated with their performance and their clear development within the organisation. So two things again, one from the top down perspective, we've got the strong consistent leadership vision for the organisation that cascades clearly into all of the organisations that make up. We have businesses in over 120 different countries and like I said, 400 000 people. And then we've got the enterprise performance management system, like I said, it's now been revised - something we call performance achievement, which you can actually read about in the public domain as well. But part of this performance management system, I believe it fosters the right sense of culture, behaviour and personal development growth for both an individual to be successful as well as the organisation. Does that make sense?

Interviewer: Yes, absolutely. Thank you very much. It was really a detailed answer and you've talked a lot about leadership and your enterprise performance systems, high performance culture, the different ways you'll actually promote this high performance culture, both horizontally and vertically. So fantastic, you really added value there. How do you handle multiple systems in your organisation?

Respondent: Can you explain that for to me?

Interviewer: Okay, you talked about enterprise performance systems right? So you could have a SAP system or an Oracle system. So if you have multiple systems how do actually get that through the entire organisation from a strategic viewpoint?

Respondent: So, I think for, we have consistent systems throughout the world okay so ...

Interviewer: So standardised?

Respondent: Absolutely standardised. So part of the driving a consistent value proposition in all of the countries we operate is having the same kind of go to market strategy, the same look and feel and a consistent client experience wherever we go. So to make that happen, not only do we align global strategies but so to other management systems. However having said that though, what we find is that given that we're a client facing organisation financial services firm, from time to time we tend to have to work with our client performance systems whether it's for time collection or time allocation or the way they do their traditional performance instruction. What we do in our organisation, we always supersede what we have to do occupationally with the value proposition of the organisation. So even our people have been forced to work regarding to policies and standards that have been set up by a client organisation we always supersede and prioritise our own value proposition to make sure it doesn't dilute a third party cultural standard overpower our EVP for our people.

Interviewer: EVP?

Respondent: Employee value proposition. We have a strong focus on our employee value proposition and that's why people join and stay with us, so diluting that by any means will be detrimental to our success. Make sense?

Interviewer: Fantastic, thank you very much. Once you've identified a new system that needs to come into an organisation, what are the next steps that you'll take?

Respondent: So one of the focuses is that in my current organisation, I look after our entire digital business, and part of the philosophy of digital is that digital and emerging technologies are intrinsically part of a business as opposed to being merely an enabler. So many organisations that get management systems wrong or technology wrong, they spend a lot of time articulating the functional or business requirement and chucking it over the fence asking IT to enable it. The culture we have in our organisation is to intrinsically bring these things together and we have a strong focus and employee experience, so ultimately what guides how we organise our processes and systems is having an impactful employee experience. That guides us ...

Interviewer: How do you manage to do that?

Respondent: So we've got many techniques and one of the techniques we use is a philosophy or process called design thinking. So, design thinking is something that in the industry you refer to as human-centred design. So what you start to do is you start to put the people at the centre of the problem and the centre of the solution, as opposed to designing a solution on functional organisational requirements, you design them with the specific nuances of people, how they live, how they work, how they want to work, their preferences and you design a very engaging experience. So we're very open-minded to not only changing our proposition to be agile and responsive, also we have an ongoing process recognise where we can improve and we constantly improve those processes in alignment of that. So in terms of your question how do you ...

Interviewer: new systems.

Respondent: how do you look at these new systems? For example the solution of the performance achievement regime change from an enterprise performance management perspective. We recognise as part of ongoing conversations with our people about serving the industry and the landscape that things are changing that we have to drive increasing relevance for our people so that was kind of the inflection point, the burning platform for driving the change and we started recognise that something had to change. We then asked ourselves how does one do that and a part of how design this, we actually design the system by ourself using our own internal competencies. So is a large technology firm so we don't only design the concept using design thinking, using our own design people, but using our strong technology of the organisation we actually built the same systems for ourselves. So as we start to build these systems for ourselves we have quite strong focus in change management ...

Interviewer: change management

Respondent: and part of the journey was we're changing fundamentally to a new set of systems, we spend a lot of time coaching our people on the value proposition and helping ...

Interviewer: driving a change

Respondent: Ja a change, driving a change journey that will actually promote adoption, ultimately if you can't promote adoption, then your system will be a failure. So that makes sense hey?

Interviewer: Fantastic. What is your view on integrating management systems? Maybe I'll pose it like this, because there's three parts of the study. It involves integration, standardisation and combination. You've also made mention of combination in your discussion. So, at which levels do you integrate, standardise and combine? Do you think that, okay maybe I'll ask you this question: Do you think that at a leadership and strategic level, that you are, do you combine systems there, or do you integrate systems?

Respondent: In terms of our organisation I think standardising is the way we've done it. So your primary technique is to standardise on the most preferable and suitable platform and systems for our own purposes. Having said that, like I mentioned earlier, in many cases we need to integrate how we drive or our performance or management systems with other components. So within our organisation we do have nuanced businesses. Sub-businesses, subsidiaries where we actually do have slightly varied systems and in those regards, we actually have a tight correlation at financial as well as a performance level that actually sucks in information and aggregates it for us at a super level. So we do have a great integration. I think the important thing when you consider integration is making sure we are relying on the outcome you want to achieve.

Interviewer: So you say outcomes, is that at strategic level or a operational level?

Respondent: Well a strategic level and then it actually cascades to operational. The reason I say that is, if you have a singular view on how you drive performance in the organisation and you have varied systems to enable an operational level, if these don't aggregate on the same common language, they tell you different things about your organisation. So what you need do to is have some kind of standard reference to actually correlate the different systems and allow this common language to evoke what it means for the broader organisation.

Interviewer: So is that, we spoke about previously, your change management processes that come into play, how do you manage to get that?

Respondent: A couple of things. I think it's by design been a large strategy, technology, process, transmission, form, it's what we do we natively. But in one regard it's found the common language that brings together disparate parts of the organisation. You know, I myself have worked in different parts of over the years and we refer to have a common language, a common language like when two people who speak different languages, it's very difficult to communicate, but how do you start to speak a common language that promotes a consistent type of communication, where you speak both, qualitative and quantitative stuff in a way that makes sense. So the common language will appeal both at a human level, a technical system level and a metric level alright, and all of it correlates back to the strategic outcomes that an organisation wants, right.

Interviewer: What would you say are the challenges facing integration of management systems?

Respondent: Well, there's probably a few challenges to think about. I think the biggest challenge is change. I think many organisations ignore the people in the journey of migrating and moving between new systems of working and I think that's probably the first thing I'd call as a massive challenge. It's something we've dealt with quite effectively but it's never a perfect solution, it has to be both a combination of launch selectivity and ongoing selectivity to renew and continually improve the understanding and endurance to a new way of working.

Interviewer: Can you just give me some information on that please, on change management?

Respondent: Sure. So for example you know when we launch our systems we will have a series of almost the pre-launch activities to almost create demand for this new way of working. So it's actually more useful sometimes when whatever you want to put forward as

leadership into your organisation, the people buy into. So when you start to actually talk to people, using our design thinking philosophy, and not having to know all the answers but sitting, engaging, understanding and when leadership shows that they are committed to making the change, that they're committed to listening to the people, that's half the battle won already. So I think one part is having these listening clinics or having these conversations to understand what's going on and then start to communicate the strategy for the organisation, these are some of the key things you've got to do over a certain horizon, short term to medium term to long term and once you've done that you've kind of to set in the minds of people in your organisation where you as a leadership want to go and what commitment ...

Interviewer: vision

Respondent: not just a vision but the values that you want to espouse in your organisation. So whether it's having a people culture, promoting stewardship, promoting quality. Whatever those values are, underpin the vision right, it's important. So I think that's one set of changed activities. Then there's a series of activities that happened during the launch of a system, whether it's to phase or rule out in a very palatable way, making sure you don't break the back of the organisation by doing a big bang approach to actually communicating and actually doing hands-on training or doing any series of things that appeal to people. What we've found is that when you work with a large organisation that's largely client facing, you can't just do once off events, so we spend a lot of time allowing people to do self-training, so they actually self-service themself by consuming on-line YouTube type content as well as having a series of interventions where people would sign up to attend on a regular basis, versus forcing people and you know impacting their daily lives on their projects. So, it's almost when you have to make a change in an organisation, it's almost having a partnership with the people on which the change will be applied. Makes sense?

Interviewer: Yes. Fantastic. Thank you.

Respondent: I don't know if it's more from a challenges perspective. I think the second point about integration, it's about this common language aspect I spoke about, I think from a common language perspective, when I think about organisations both in terms of, but also organisations that we serve as well, common language is important because you always find that with leadership, it's thinking [?] what leadership says and what people believe on the ground are three different things and I think it's vitally important that we find a way to align these different constructs, it's almost to demystify the organisation's strategy at all levels in the organisation. And why is it important? Because if there's no consistent appreciative understanding of the strategic direction of the firm, consequently how it cascades to individual business units is incorrect or is misaligned and consequently, the way you start to define and develop your own systems becomes actually a lot more separate and divided and you start creating silos ...

Interviewer: it's difficult ...

Respondent: It's difficult. I think this common language promotes for me at least a method whereby you start to find that if you do want to integrate and talk to each other it's a whole lot easier than having manual systems. So, a common language in my mind is important. I think the third thing is putting the employee first, so what I mean by putting the employee first, I think in an organisation, or in a workforce rather, that's evolving, you talk about the workforce of the future, and talk about a large part of the organisation being a millennial, or you're being born after 1980 right, and what does it mean? It means that people that work in organisations will have definitive nuances and expectations, or nuanced expectations of the how the organisation will look after them and how it will be to work in these organisations. So for example to be practical, we find that the lives of our people tend to intertwine and overlap to their personal lives and their work lives, therefore it's imperative that organisations understand how their employees wish to engage with the employer and put their expectations first and foremost when you start to design and conceptualise the system that you wish to roll out. When you put an employee first, not only do you find better requirements and better expectations but the chances of adoption later on, post your capital investment is a lot higher.

Interviewer: Okay in the organisation at, in the organisation do you have an integration policy?

Respondent: What do you mean?

Interviewer: You said that when you integrate management systems, the systems should be integrated or standardised through an organisation. So do you have a document to say, in terms of integration to say that this is how it's going to be done?

Respondent: You look at number 9?

Interviewer: Ja.

Respondent: So on number 9 I can help you as well. So we as have adopted CMMI as a standard within the organisation right, and the minimum level we have globally is level 3 so it is of our ways of working, it is our maturity. We have a minimum level of level 3 as a global standard.

Interviewer: CMMI

Respondent: CMMI is capability maturity moderation integration.

Interviewer: Oh, okay.

Respondent: So it's actually a standard.

Interviewer: Okay nice.

Respondent: So it's called CMMI -you can check it out. It's run by SEI which is the Software Engineering Institute at Carnegie Mellon University. So we use all our methodologies and ways of work that's underpinned by a highly mature standard so that's a point and you were then asking me around?

Interviewer: The policy, the integration policy.

Respondent: Okay. Just clarify what you mean please.

Interviewer: I think the … Okay lets just. Maybe what I'm asking here is there is an integration policy for your organisation?

Respondent: What does it mean integration policy?

Interviewer: So the integration policy, maybe like a quality management policy? To say that we want to serve our customers and we will make sure that we have all our objectives in place and it's similar thing like that.

Respondent: So, one, we aligned many industry standards, CMMI is one of them right, there are many other quality standards - ISO and others that we aligned to. So has built out its own delivery methods, what we can delivery methods, which is a library of ways and methods of working. So both internally as well as how we serve our clients it's very standardised and aligned to best practices that we've adopted. So every person that drives is trained in how we work. It's part of their induction into the organisation. So we have a huge belief into the value proposition which means that we need to understand and sit with all our people to be introduced into a new way of working.

Interviewer: On boarding.

Respondent: Not just on boarding but on boarding is [unclear 03:59]. Because we're a heavily IP based organisation and we don't have physical assets the IP in our people is of fundamental importance. So we have a large amount of rigour in articulating how the IP manifests and how it gets used by our people as well, both internal to the organisation how it cascades from global to our local teams as well as in terms of how we serve our clients. We have not just policies, our policies are very strong policies, whether its ethics, or compliance, or whether it's a finance management or time reporting we have all the key policies in place that enable to appoint a standardised way of working.

Interviewer: Do you have … maybe you have answered the question I'm not sure. Do you have a framework which you use for the integration of management systems in your organisation?

Respondent: Yes. So part of what I just answered you know we have a, it's actually an overwhelming robust set of libraries of how we do that. Within a global organisation of our size you've got to have that because it's something I grew up with in the 90s and still today we use that to promote a consistent way of working.

Interviewer: we have discussed many factors in this here. We went from high performance culture, we discussed your change management processes, we've actually discussed your policies as well. In this study or in this interview, what would you think that I need to discuss more that I've not addressed with you enough?

Respondent: Let me just think. I think one of the things I would say is it's not the kind of work I do, it's the tight correlation between technology and management methods in an organisation. I didn't use the word management methods or management methodologies. The think that we need to step away from this notion of technology being an enable for a way of working, I think that in a digital world where people are intrinsically connected to the internet, to organisational systems, to technology, that management methods and systems can be overhauled to be much more efficient and effective. I find in many cases that the organisations get it wrong every single time and you always find that the way that systems have been rolled out, I never seem about right, they're always missing something. I think two things: One, we aren't cognisant of us living in an intrinsically connected digital world and certainly like I mentioned earlier, I don't think we put users of the systems at the heart of what the systems need to be. So I would actually try to explore that, it's something that we call design thinking and design thinking is an entire philosophy of people centred design. It would be good to explore in your research what is the role of people in this design and if you actually put people first what it would mean for well established premises and approaches towards management systems.

Interviewer: thank you so much for your time, I really appreciate it, I know you're very busy guy, to afford this opportunity for a student to continue the studies means that you guys are very committed to moving the countries agenda forward. Thank you very much, I really appreciate it.

Respondent: Thanks again.

Interview **5**

Occupation **Technical Manager**

Sector **Government**

Interviewer: So good day Mr Anthony. Thank you so much for your time and the opportunity for me to interview you. I know your time is really hard-pressed and for you to allocate some time for the study really means that you are dedicated to moving the agenda of the country forward in terms of doctoral students. Thank you very much for that.

Respondent: My pleasure, I hope I can contribute meaningfully.

Interviewer: So, today I'm here at your offices at the South African Reserve Bank, and as I've indicated that I have, my study title is The Framework for the Integration of Management Systems in the Organisations. I am developing a framework that will assist policy makers, organisations, leaders, in terms of how we should integrate management systems in organisations. So I'm going to ask you a list of pre-determined questions, but before I go into that, can you please give me a brief history of your background, how long you've been with the South African Reserve Bank, and any meaningful information that you can add to the study.

Respondent: Sure, so I've been with the Reserve Bank - and coincidentally I put it on my wall today – exactly today I've been here for 37 years. 1st of December 1979 I started. So I start my 38th year today. So I've been at the bank for 37 years, and I've been primarily – I started in a branch, but primarily has been through the IT department, so I've seen the IT move and different technologies and the interesting times of technology as it pertain …

Interviewer: evolved

Respondent: evolved and as it pertains to the Reserve Bank over that time. So I've moved from very, very technical, highly technical areas where I was deep in terms of coding and developing, designing, analysis of systems, but then that progressed at some stage about, must have been fifteen, twenty years ago, to more supervisory management and now a leadership position. So I've really been through the whole mill here at the Reserve Bank, but by and large through what we call the business systems and technology department, which is the IT department in a nutshell which is charged with aiding IT services in the Reserve Bank.

Interviewer: I think I have the ideal candidate here because you've come through the ranks and been at all the different levels in terms of the operational level, at a business unit level, and now you're at the strategic level where you make decisions with your colleagues in terms of management systems and systems integration.

Respondent: Absolutely. So management information is vital to my daily day-to-day and ongoing reporting and knowing where we are at any point in time, particularly with IT systems in the Reserve Bank, so it's extremely important for me to have information available for decision making.

Interviewer: And it's very important but you've just mentioned. You said that you have information for decision making, so you're making informed decisions, and you use management systems for that.

Respondent: So I can elaborate on that, so we don't have – we don't have – for our management systems at this point in time it's still a little manual in terms of collecting the data. The data is all available, we haven't matured into a point where we have got a nice automation system where it pulls data from all different source systems into a data warehouse and makes it available through a nice dashboard that has drill down capability, but we're certainly, we're quite proud of the fact that our dashboard has strategic measures in place and operational measures in place. The only pain, and funnily enough, Monday this week we had a session where our risk management and compliance department and one of the risks in that is that we don't have this fully automated. So, it is a bit of a cumbersome process to put this all together, but we certainly have the information and we measure ourselves across quite a few dimensions on a strategic level in terms of the value add that we are providing to the

bank and certain other areas, and then we have an operational scorecard. So the information is all available and our only sort of concern at the moment is that it's not fully automated to a proper BI solution where we can drill down and it's actually, strange enough, it's related to the shoemaker's shoes syndrome. We deliver these solutions – proper solutions for the rest of the business, but for ourselves we sort of neglect the last in the line. So we have an automated and nice collection – a place where it can be analysed and if need be, disseminated and measured. So we've got smart measures in place for each of these.

Interviewer: Thank you. Thank you so much for that background and I'm sure it's some important points that you made there – strategic level, operational scorecard, so we'll go more into that as well. Okay. I think, all I'm saying at the moment is, what do you define as a system? So it is your view and your opinion.

Respondent: So is a system generically? So not as a management system, or information … Generically as a …

Interviewer: System, yes.

Respondent: I would say as a system, and I'm trying to recall back from my days of studies as well, which would comprise at a very basic level, some sort of level of input processing and output that would put that into a nice sort of framework together. So that, and you know, the second level too, so that would be your system would include the processes, the people, the technology and the information to make the system work. So some of that would be on the input side and some would be on the output side. So, that's the basic concept of a system that can be stored.

Interviewer: Yes, yes, no. Fully. It's a very practical, what you've just told me. Input, transformation, output, but also, it's a transformational model. In terms of an integrated system? What is an integrated system? And normally when I talk about an integrated system, one would talk about, as your body for example, it's a system, and with that you would have probably the nervous system, the digestive system, your thyroid system, also forms part of that. So, when I talk about an integrated system, I'm talking about all of these things working together. What is your view in terms of an integrated system?

Respondent: What's very interesting and perhaps relevant is that the bank under the current leader, the governor Lesetja Kganyago, has transformed strategic management processes quite radically and for the better, over the last 18 months, where we're looking at strategy from a bank level, a cluster level where we have certain clusters in the organisation and below the clusters we have these departments. So for me, and to answer your question and to relate it to this organisation, would be this integrated nature of it is that the parts of the business and the silos which we maybe have been operating in previously now come together in terms of contributing and making meaningful, adding value in terms of individual divisions – individual departments rolling up to cluster level and then to department they want. So all of this comes together, talking to each other and it's also top down and a bottom up approach, but at the top down we have very clear strategic focus areas and these need to be cascaded down. In fact right down to the individual performance contracts, so that these parts, even each person in the organisation in the system of management information system that's integrated, is that it's all got to come together to roll up into the ultimate goal, mission and vision of the bank and the five very strategic focus areas.

Interviewer: What are those key strategic focus levels that you are involved with?

Respondent: So in terms of when you mentioned those five?

Interviewer: Yes, those five.

Respondent: Okay, so five I can tell you what they are. Naturally the one would be to maintain headline inflation within the target range. The other one relates to financial stability, to achieve a safe financial system in South Africa – which is broadly the forest approach, where we look at the trees approach, that relates to the banks, we promote and enhance the soundness and integrity of the financial institutions and financial institution market structures that we regulate, so we assist them. We ensure the soundness of the banks. That's where our bank supervision rolls. So essentially protecting the man who's

putting his money in the bank. So that would be the third one. The fourth one is to enhance South Africa's resilience to external shocks. So that is one where we really look at building foreign reserves. There's many more other ways to do it, but we build foreign reserves. Enough to survive any serious shocks – American President changing, how does it impact [unclear 20:42].

Interviewer: on the country. Okay.

Respondent: And the last one would be the obvious one which is related to the delivery or the – trying to figure out the right word there – to maintain or ensure the quality and integrity and availability of notes and coins. So those would be the five at the highest level. Now those cascade down. They cascade down to every department, every cluster and then every department …

Interviewer: So cluster, then department?

Respondent: Cluster then department. So cluster consists of a few departments, and then down into the departments have their strategic sessions which link up into this and divisions then have to typically, the division that I have has to link …

Interviewer: to the strategic …

Respondent: to the strategic …

Interviewer: So you have strategic, then you have a division, then you have a cluster, then you have a department.

Respondent: So actually we do it overlap [?]. Division in many organisations is the – we have strategy, then we have the clusters, then departments, then division, so it's weird, ja. Just legacy. It's always been like that and we …

Interviewer: left it like that.

Respondent: So the integration of this is the beauty when these things come together that people, because we have suffered before in the past where people – we'd been putting out information, or requesting information from financial institutions and other economic sectors and the same department or another department within the organisation, another cluster, requesting the same information, analysing it and disseminating it and perhaps with a different outcome to what we've had before. So the beauty of this now, is we're driving towards, we're not 100% there yet, but integrates it brings it together so these different body parts are now working together.

Interviewer: That's very nice to hear. Would you say that this is integration or some sort of standardisation or combination? Are us combining all of those integrating?

Respondent: Ja, so integration there is some stabilisation or even harmonisation in terms of how we do things, but across all those levels, from an absolute ICT tools perspective, we're looking at standardisation. So we're looking at a proper CAD solution, which is collect, analyze and disseminate information, across the board, enterprise wide we do it the same way.

Interviewer: So is it from top down, or just at the divisional level? You said that's the lowest level no?

Respondent: Yes, the divisional level would be. Below that you will get sections, but essentially the divisional level …

Interviewer: Is the operational part?

Respondent: That's the operational part. We'll have our operational planning [unclear 17:59]

Interviewer: So you standardise that?

Respondent: Ja, we standardise that.

Interviewer: And at the strategic level?

Respondent: Strategic level there's a lot of standardisations. Setting up the management systems. The scorecards. There's incredible standardisation around the measures and how we – you know, the smart around our scorecards. So that standardisation is there, in terms

of the management information systems. So setting the scorecards and putting in smart measures so that we're very specific.

Interviewer: So it actually filters through the entire organisation. So everbody understands.

Respondent: Everyone understands. Should. It gets communicated very well. You know, there's information given to everyone should be ready at any call to talk about the – which really talks about our strategic plan, but it's rather about our management information systems as well.

Interviewer: It's documented.

Respondent: It's documented and of course and communicated regularly, so …

Interviewer: What do you understand by a combined system?

Respondent: A combined system?

Interviewer: You gave me an integrated system, a standardised system. A combined system?

Respondent: That's interesting. I don't … I'm not …

Interviewer: Because us said something about working harmoniously.

Respondent: Yes. So maybe there, because we are a group in essence. We're three entities within the SARB group. We have the SARB head office and then we have the two subsidiaries – the one being the bank note company who produce notes, and then the mint. So that's really where a lot of harmonisation has been done. So possibly there I would think combined would be when you combine – even from a financial point of view, you combine different financials and you present it at group level.

Interviewer: So you combine?

Respondent: Well, in terms of management information systems, that is not happening at the moment, no.

Interviewer: Not. Okay, that's fine. Mr Baron, please can you tell me the type of management systems that you have in your organisation?

Respondent: Okay, so in terms of the different technologies and so forth?

Interviewer: Yes. You can give me an example as well if it will make it easier. You can say probably the other companies will say they have a SAP system, they'll have an ACM system, while others will say, "I have an Oracle" and they have different modules.

Respondent: So absolutely, we have Oracle ERP system, we have this information …

Interviewer: So, it's Oracle ERP.

Respondent: Oracle ERP, which is the main … and when information is extracted out of that into scorecards, those scorecards are largely Excel based but it's an Oracle ERP system where a lot of that information, the source operational information is sitting there.

Interviewer: Okay, so is it your only management system? It's used throughout the organisation, or do you have a SAP, or?

Respondent: No, we don't have a SAP. At the subsidiaries, we have a SAP at the mint and that brings its own challenges and there is some thinking in …

Interviewer: in terms of integrating or combining.

Respondent: At the moment, we've done a feasibility on that and we have a JDE system sitting at the bank note company.

Interviewer: So you've got JDE …

Respondent: at the bank note and we've got a SAP system at the mint and at head office we've got the Oracle E business. So, the idea, we've been through a major exercise now the last year doing a feasibility on these two together. Even though they're essentially a manufacturing entities, but there's a lot of commonality. A huge amount of commonality to say we can bring them together so the management … and I'm sure the financials as well, which is part of a …

Interviewer: So now that we actually have different entities. You did say entities, right?

Respondent: Mmm.

Interviewer: You have JDE, SAP and Oracle. So, how do you work with these multiple systems at head office?

Respondent: Okay, so at head office there's some integration, into our systems, but not much. I guess there's room for improvement, so … It does become different when you're trying to produce combined info – combined [unclear 13:28] information, so that's why the initiatives are to bring this all together and to consider one ERP solution for, you know, going forward. So, at the moment, I'm not totally involved in the group type of reporting levels and so forth, but I would guess that a lot of it is bringing it together and a lot of manual [? unclear 13:50].

Interviewer: Because of the different management systems.

Respondent: Ja.

Interviewer: You have SAP, Oracle and JDE.

Respondent: Ja, so I think reporting and a group level would be – it would take some serious manual intervention there, but those things don't come together nicely.

Interviewer: Once you have a new system that comes into the organisation, how do you handle this? How do you handle this new management system that comes into the organisation, how do you handle this? How do you handle this new management system coming to the?

Respondent: If you mean handle it, by?

Interviewer: See, probably it's a strategic decision. You come into new management or something. So how would this actually filter through the entire organisation?

Respondent: Okay, so the first step would be to be building a business case around the need for this new management information system. And we have governance structures in place where such an investment would be considered looking at clear business versus cost and …

Interviewer: feasibility.

Respondent: feasibility. Well, ja, doing a feasibility and considering the dimensions of benefits cost and risk. Risk of doing and risk of not doing. So you know, that would go through the normal structures of approval. After that it would, you know, let's assume it is adopted, or it is approved, we would have a clear programme of project set out to execute on the delivery of that and what we have really focussed on largely with these types of initiatives where it involves significant change to people is that we put a big change element into that to precede the change and to work alongside the project team to continually remind people why the change is necessary and the need for change.

Interviewer: What is in your view, the integration standardisation or combination of these proceses? You said that it's very automated, but it's also a very manual process. What is your view?

Respondent My view is that we've got room for improvement. Serious room for improvement. The integration, you know, we do have it at certain levels where we bring information through from any of those systems individually. But as a combined perspective, I think there's a gap and where we need to put some work into it. Actually, each of the departments …

Respondent: Combined at a strategic level?

Interviewer: At a strategic level, yes.

Respondent: At the lower level we still have a situation where we're pulling in a lot of information from the source systems and if we want to sit. If I want to sit with my management team, and the six of us, my view is that we should be having it readily available. It shouldn't be a major job …

Interviewer: to extract the data.

Respondent: To extract the … for people to go and get the data, get these statistics and pull it off together and then to say, "Okay, how're we doing against the measure, you know, are we in trouble here?" and so forth. So, lots of room for improvement and …

Interviewer: The room for improvement is because it's purely manual systems?

Respondent: Ja, so obviously there's some … the automated on the lowest levels, it's there, but the bringing it together is manual, and that again is putting a proper data warehouse with an ETL tool or a data integrated, can pull this data together, put it into a dashboard, setting up some sort of user interface for dashboarding and allowing some drill down capability, which would really just make it …

Interviewer: Why hasn't the South African Reserve Bank done this already? It seems to be consuming a lot of your time.

Respondent: Yes, it is. We at the moment are embarking on, what we're calling an enterprise management initiative, which is massive. This is one of the below those five strategic areas, we have certain cross cutting initiatives. EIM is one of them. So EIM will be driving this. You have the proper scorecard in automation business intelligence. So we have it in pockets, we just haven't brought it together.

Interviewer: Okay, thank you very much Mr Baron for that excellent overview. Describe the policy on integration in your company.

Respondent: Integration in terms of technology or?

Interviewer: So, policy's normally at a very high level, it's at the C-suite brass level. So you must have a policy there. Like a Quality policy management system. You must have a policy, and with quality management system policy, you'll have, what is your vision? What is your values? What is your key objectives in terms of quality? So for integration, do you have something like that?

Respondent: So, we don't have a … We have a framework on a policy for quality management, but not on integration.

Interviewer: Okay, that's fine.

Respondent: So, a policy within integration management direction, there's no specific policy on integration.

Interviewer: No, that's fine. That's no problem. If you don't have a policy, that's fine. To what extent are the different policy systems combined with, or integrated within the organisation? I think you've actually mentioned that they actually combine at a strategic level towards the division that's integrated.

Respondent: Ja.

Interviewer: What were the role of senior and top management regarding management of these systems? What would senior level?

Respondent: I think the involvement would be, at the outset, initially, be very clear in terms of what it is that you would want to see in terms of the information on the management information, dashboard or reports, whatever. So, it would be, I think the involvement up front would be absolutely critical in defining your specifications, your needs in saying what it is you want to see. And then naturally the frequency and how you would want it presented, you know, other email or paper report or so forth. So having the information timely presented and ready for decision making. So the involvement, I think strong involvement up front in defining what is required, and then naturally the use thereafter …

Interviewer: Frequency, presented …

Respondent: So the involvement would be continually using them and possibly refining with a continual improvement.

Interviewer: Updating

Respondent: Updating and refining it and so forth.

Interviewer: Do you find problems in that area?

Respondent: No. I think lately the discussions are so rigorous around this because the bank has moved with the new leadership in terms of setting these scorecards and management information systems. So, I think the climate is set to do this. So I think it's all welcome at the moment and the …

Interviewer: That's interesting, there's a good culture?

Respondent: There's a good culture and climate for this … [unclear 05:43]

Interviewer: When you talk about climate, what kind of climate are you talking about?

Respondent: The climate that I'm talking about is that where we really move to enabling and thinking strategically, and we really …

Interviewer: We?

Respondent: The leadership. So where we start pushing down and the governor talks about untying the chickens' legs. Let the people do their job and let the leadership …

Interviewer: Empowering?

Respondent: Empowering people. Let us stop getting involved in the operation of jobs. Our job as leaders need to be largely around the strategic focus areas and thinking strategically how we move this organisation forward. So the climate is there. The scene has been set from leadership, and that to me is important and it's repeatedly set from the leaders.

Interviewer: When you have new systems that come into an organisation, discuss the process of how you would integrate, combine or standardise.

[interruption]

Respondent: Say again, when you?

Interviewer: How would you describe the process of managing integration of new systems in your organisation?

Respondent: Okay, so for any new system, but even in this regard of a management information system, for any system, we have some governance bodies in place that talk about for … we have an enterprise architecture function. So they'll have an architecture review committee, but prior to going there, the standardisation and integration will be discussed at a forum called ASDA, the Architecture and Design Standards Authority. That's the ASDA – A – S – D – A. So that's the Architecture and Design Standards Authority. There the standards have been set. So to introduce something different in terms of our incubates and new technology, we follow that those systems.

Interviewer: At what level do you think the majority of integration in your organisation is?

Respondent: I would probably, if you take any of the capability, maturity levels, I would say we're probably at a defined stage, I wouldn't say …

Interviewer: Would you say level 1, level 2?

Respondent: Level 3, yes. I wouldn't say ad hoc. I think we're beyond that.

Interviewer: So probably at a intermediate level.

Respondent: I would say at an intermediate level, ja.

Interviewer: You said something about the manual to the automated that still needs to go through that.

Respondent: Go through that. So it's levels 4s and 5s where it's clearly measured and optimised, I guess we're not there yet. I would say intermediate level.

Interviewer: Do you have a framework for integration in your organisation?

Respondent: That's an equally, the policy and framework. You know, on the int … I must admit, on the integration, I'm not quite getting the connotation to the management information systems, so … I know, obviously we have strong integration on the technology side.

Interviewer: But on the human side, would you say that they understand the system and they working with the systems well for you to get the desired output?

Respondent: Ja, so that certainly, I could say that, ja. [?]

Interviewer: We've gone through the study now and we've discussed a lot of things about integration, standardisation and a combination. In your view, what should I address with other participants in terms of what I've just discussed now?

Respondent: I think top of mind for us at the moment is, you know, with management … specific to management information systems, is to be very clear in terms of your measurements, to make them smart. You know, to be specific and measureable …

Interviewer: measureable and realistic in timeline …

Respondent: [unclear 01:42] relevant in time. So that is something that would always be something that I would always ask. You know, how're you doing across those five dimensions? And ja, a continual measurement on those and reporting on that. So we report on them. We're very, very focused on execution. So we see that as a basic fundamental where we like getting the foundations right and all that, but the whole fundamental building blocks around this is execution and measurement, so we don't set it and have the management information systems …

Interviewer: Doesn't work for you.

Respondent: And we just let it go.

Interviewer: You also mentioned something about change as well.

Respondent: So change for us is important to take the people along. So with all of these change management programs running alongside it to clearly be, not the soft type change management – give the guy a chocolate and a pamphlet and say, "Change it on Monday. This is the real stuff guys, this is what's in it for you, this is what's in it for the organisation, this is what's in it for the country, this is why we're doing it and we must be proud of why we're doing it. Why we're changing to this way" And then that is very important to the bank at the moment, to take the people along with us on a journey.

Interviewer: Absolutely. Mr Baron, thank you so much for your time. I know that you're running into another appointment now. I really appreciate that you could set aside your very important diary for me in terms of my study, I really appreciate it and I thank you once again.

Respondent: It's only a pleasure, I really hope I've contributed.

Interview **6**

Occupation **Chief Information Officer (CIO)**

Sector **FMCG**

Interviewer: Good afternoon and thank you very much for your time. It's five past twelve. We're meeting here at Foods offices in Waterfall. Firstly I must thank you for your time, for sacrificing for my study. So basically, can you just give me a brief overview of your company, what you do and your experience as a CIO. I do have a brief questionnaire that we will go through, and we'll take it from there.

Respondent: So, I've been with the company since July 1999. I started out as an accountant at a maize mill, took over as a financial manager at a wheat mill, I then spent a couple of years in group finance, group consolidation, group treasury, those kind of things. Moved into IT in November 2004 and I've headed up IT for the group ever since. In terms of our company, our company we've redefined as an FMCG company in the last two or three years. The company now distributes a lot more than it originally did. So, what we now do is maize and wheat products. Made goods. We also do sugar confectionary – candy and feminine hygiene products like lil-lets, Vulco, Dove, cotton products etc. The company's grown quite a lot over the last four or five years, expanded significantly. We have around fifty-two branches now, mostly in South Africa and neighbouring countries like Lesotho, Swaziland and Mozambique and we have a presence in the UK with sourcing from the Far East and distribution to the Far East and Middle East and in South Africa and neighbouring countries. In our business manufacturing is important and people think we are a manufacturing company, but we're primarily a distribution company. That's what is about. So we're round about a thousand vehicles doing deliveries daily to about 27 000 customers a minimum of once a day and what we've noticed is getting the product to the customer or the consumer when he needs it at the quality level he needs to, at the time he needs it is actually more valuable than any of the other areas in our business, so that is what we're really trying to manage. So, when you look at our business, it's better to compare us with a logistics business, not a manufacturing business. And that's where we've invested, so in the last ten years worth of IT investment, the bulk of investment has specifically been what we call stock to cash cycle. So starting from warehousing, out to the customer and then back in again collecting that cash and managing all that processes. That's been the bulk of our investments. The manufacturing side actually does not receive the bulk of the IT investment. There we looking at manufacturing investment. The business itself is about 150 years old, fairly large company. It sells around 550 million loaves of bread a year and about a million tons of maize and wheat combined a year - so a fairly sizeable business. It's a volumetric business, so in the milling side, look at something that delivers to two or three customers at a time, normally around 30 tons on a vehicle, look at R20 transaction complete opposite, there you look at 30 to 70 deliveries per vehicle per day.

Interviewer: Okay. Thank you so much for that.

Respondent: Pleasure.

Interviewer: Okay, if we really go into the study, the study involves – if I can give you the title of the study – the study is a framework for the integration of management systems in organisations. So essentially I'm developing a framework as I identify the gap in literature. So I'm going to ask you a few questions and you can answer it to the best of your ability.

Please provide a brief outline of management systems in your organisation.

Respondent: We've a large number of management systems, but primarily we follow a Microsoft strategy, so we follow a Microsoft ERP system, being Microsoft Dynamics GP as the core. What we do, if that product is not suited to our needs we will procure additional add-ons from certified partners for it. So we don't develop. We procure the specific new solutions that are on the product. So we look from laboratory for management information systems new product development management systems which is project management production systems, and then warehouse management, yard management, distribution management, vehicle tracking systems and then from that

comes back into reconciling and debriefing systems, cash handling, which roles up into our set of financials, debtors financial systems, creditors management systems, fixed asset management systems, fleet management systems, fuel management systems, and security management systems.

Interviewer: Shew. How would you define a system?

Respondent: You get to views on that world. Some people see a system as a set of technology. In our world we typically talk about a solution. A solution is a set of processes and technologies and SOP's that satisfy a very specific need around the company. That's how we see a system. So, it's close to what you may call a solution in the world.

Interviewer: Would you say that the type of systems that you have, would it be integrated systems? Combined systems? Standardised systems? How do you go about there?

Respondent: So we believe in buying before you build, but build before you change the business process. So what we will first do, is we will take a business process and look at available solutions in the market and we will procure around that very specifically and we'll get quite creative with the configuration and truly exceptional systems, it's not, we will build our systems. When we integrate and consolidate it's on a business intelligence side. We look at management information. So all the various solutions and their niche areas will feed into your business intelligence systems, and from there we'll report and play with it, but integrating between processes is a very risky approach and we try and avoid that as far as we can.

Interviewer: So how do you do it?

Respondent: We standardise on the Microsoft platform. So, our theory is you follow the RND spend around the world. So we looked at the big OEM provider, we look at the RND spend and where the money goes we try and invest there, and then you right the waves. Sometimes the solution is the best in the world, sometimes it's not anymore. Every couple of years the position changes. So we play after those big players, follow their strategy, and then we use their certified partners to actually develop the solutions for us and to integrate the solutions for us because the simple maths is, if you start integrating solutions, you're sitting with two solutions, plus its integration. If you are each uptime by 98%, you can immediately say your overall uptime is going to be around 94% only, around the entire solution. So the more systems, the more integration, the more lower your reliability becomes. In our business 30 minute SLAs is critical. If a truck needs to leave, I have 30 minutes to get that truck on the road. And in terms of IT, that's not long enough to do support. So your reliability is absolutely, absolutely critical. So we avoid integrating in processes, we rather integrate towards information: extracting the data through an ETL process from the sub-system and putting it into a data warehouse and then from there on working with the data has been a lot more reliable for us.

Interviewer: Fantastic. So how do you work with the multiple systems? I think you must have answered most of that there, is that you extract the data and you put it into a data warehouse. Is that?

Respondent: That's correct. Data warehouse and then from there on we start building cubes, or fit data mats. We now busy working into data lakes, which will at least first …

Interviewer: Data lakes?

Respondent: Data lakes. You need Microsoft as your data lakes, which is a very large collection of a number of data. So, we'll be migrating into that early in the new year and then we'll start playing with artificial intelligence and stuff. Late in the new year.

Interviewer: When you have new systems, what happens to them? You know when you have a new system that comes into the organisation, what happens to them, how? Obviously you said that it's at a strategic level and you get it into the? How do you get it into the new level? How do you get new systems into the organisation?

Respondent: Very carefully. We believe in prototyping, so we don't follow the old school waterfall approaches anymore, it was a highly unsuccessful environment. So what we do is we've taken the planning time originally in your STLC process, we've allocated it to a lot more

prototyping time, so we will go through a fairly fast procurement cycle in our solution, compare it to our IT strategy, our company strategy, our brand strategy and then filter it down to a small selection, preferably one solution, maybe two, we'll put it in on the site and then prototype it and we will not leave that site or move that solution any further until it solves real world problems. So we believe the real world experience. We believe in seeing what happens when it hits the road, and once that has fully satisfied business need, then we move into a pilot, and in the pilot we actually test the implementation processes of those solutions, so prototype test the theory and the implication and the business value, pilots test the implementation of this in the business and then we actually implementation.

Interviewer: You have mentioned that you actually try and do away with integration. Do you combine systems or standardize systems, or?

Respondent: We standardize.

Interviewer: So do you integrate and then standardize, or?

Respondent: When we buy businesses, for example, we will bring that business onto our systems. We call that integration of the business. So we will go in with our staff which now knows the environment – our SOPs, our processes of way of doing business, and on board them onto that. We hesitate to integrate systems, because the reliability typically can't make our business needs.

Interviewer: To what extent would you say the different management systems combine integrated or standardised within your organisation? To what extent?

Respondent: At a process level, very, very low integration, it's mostly their standardisation, at a BI level we've combined all of the data. So we've got one warehouse where all the data of all the various systems – whether it's internal or external systems – all feed into. So if you look at our systems, we either have systems that's internal and we run, or we have an application and software solution which we run, or we have third party solutions which outside companies can provide us with data, and all of the data we put into the same data warehouse.

Interviewer: So at a business unit level you combine, and at a process or operational level you integrate?

Respondent: At a process level we use best practises, so we standardise on a specific solution.

Interviewer: Oh, okay. So you're using SOPs then?

Respondent: Yes.

Interviewer: Okay, what would the role of senior or top management regarding management of these systems?

Respondent: Day to day management of the systems or the output of the systems?

Interviewer: I think you can give me both.

Respondent: Okay. So the systems themselves …

Interviewer: If you can give me some examples, if you have …

Respondent: So the systems themselves, senior or top management involvement is fairly low in the day to day operations, what we do is we allow management to explore or test. Not top management, but senior management.

Interviewer: Management systems?

Respondent: Ja, so we'll allow these guys a bit of RND in a very close and safe space, they go and try a variety of systems, get their own exposure and see what they like.

Interviewer: Can you give me an example?

Respondent: Yes, so for example, we looked at route optimisation software. Route optimisation is an algorithm that runs around your customers and vehicles, tell you the best sequence to deliver to those customers. So we'll create safe spaces on people's laptops, they'll play with the software and see if it actually makes money and works for them. Once they get

to a point where it's proven viable, we'll take it over and we will formalise that process in that technology into the company and we'll standardise it and deploy it at every branch from there on. So we create a little bit of flexibility for that senior management over there. Once we've taken it over, we look at the operations of the system. The system produces a set of KPIs from it which tells you whether your environment's healthy or not, which is where the business gets involved in. So we guarantee the system up to the KPI. The interpretation of the KPI is then up to the business to see what their decision is going to be.

Interviewer: Fantastic, thanks. How would you describe the process of managing the integration combination or standardisation of new systems and amendments into an organisation?

Respondent: Your most difficult thing to deal with is change management by a long shot, and it's not just a human element, it's also the process changes you've got to deal with. Often the new system is championed by people who doesn't know the old systems as well, or somebody who's unhappy with the old system and you need to manage their expectation versus the current people's reality and you need to manage that road map quite carefully. So typically what we will do, we will break it into a nice small manageable chunk. We will pick a portion of the business where we can accept some risk on – normally a small branch. We will let this person champion it on the branch. We will put it in some resources there and see if they can make this work.

Interviewer: What are the typical things that you find?

Respondent: The typical things that we find, is that people underestimate the complexity of what they are dealing with – the real world scenarios. People underestimate what the impact is of touch time between humans and systems. For example, a small thing we tried a couple of years ago, we have a call centre system that is keyboard driven for people taking telephonic orders. We moved to a more modern system, you know, that had mouse clicks, buttons - things like that. People's ordering capturing slowed down for the very simple reason, these ladies memorised the keyboard so well, they could type orders without ever watching. You cannot click a mouse without watching the screen. So the ladies couldn't capture faxes and other orders with the keys they had to. So people were driving more modernisation came in and said, "You need a new system, you need to have a nice user interface, beautiful graphics, little BI formulas, and stuff like that." It actually slowed down the process and had negative consequences for the business. You need to understand what it looks like and then design around that specific need the person has there.

Interviewer: Shew, okay. Interesting. What would you say the challenges facing systems and systems management? As you mentioned you said that there is change management as an issue …

Respondent: Change management firstly, and then I think integrators in South Africa specifically is a problem to us. We have very low levels of skills available to us in the market implement systems. So my bottleneck in terms of the number of systems I can implement is actually the number of skills resources I can find. It is not project management or any of those things that you think. People understand your business and is able to implement a system in your business is by far the biggest constraining problem.

Interviewer: So what recommendations can you offer?

Respondent: You know, what has worked quite well for us is to not be too arrogant. Companies are quite arrogant in some cases where they think they are all best developers; they can develop the best systems, integrate it the best. And you should avoid that. If you think of someone like a Microsoft or an Amazon or a Google or any of those, those guys spend on RD exceeds our turnover. It is very arrogant to believe my developers will be better than theirs. It's a matter of statistics. They might have a couple of thousand developers; I might have five. So statistically speaking, they have a better chance of having better people developing something better. So you should be very careful to go and see what the market really, really looks like, and once you've done that, even if the solution doesn't exactly match what you need, first choice, get the developer of that project. to change it to your needs instead of trying to do it yourself. If you can get those guys to deal with that complexity for you, they've build it into your upgrade path for you,

your patches, all that stuff now is built for your business, so your maintainability in the long-term becomes much cheaper. If you think about it, if I develop a system now, every time Microsoft patches the operating system, I have to fix it. if I get a Microsoft partner, or an Amazon partner to do that, every time that system changes, so that operating system changes, they will release a new patch. I don't have to do it. They'll certify it, they have a thousand customers out there testing it for me. I'm not the guy having to carry the school fees anymore. I'm sharing it with a whole bunch of customers out there. So don't be too arrogant.

Interviewer: So you're sharing the responsibility?

Respondent: Sharing the responsibility, you're sharing the risk.

Interviewer: Okay. How do you determine the level, or the maturity of integration, if I can say, in your organisation?

Respondent: By how many times it breaks, and how many people it needs to maintain. So in our world we see a mature integration system as one that achieves Six Sigmas in terms of uptime. So at least Six Sigmas. We've got to have 6.3 [six. three] below failure rate and no human interaction at all.

Interviewer: Can you give permission for Foods to be mentioned in the study?

Respondent: Yes. FMCG now, not Foods anymore.

Interviewer: Okay. At an operational level, would you? Maybe it's open for discussion – as I mentioned, I can come into your organisation and look at how management systems are being implemented and identify the gap from literature and provide feedback. Would you appreciate that?

Respondent: I'd be happy with that, ja.

Interviewer: Okay. I think from a … I think that's it. Yes, you've answered most of my questions, and you've answered them fantastically, thank you so much. What I do, it's 12:30 and thank you so much for your time, I really appreciate it and I know that you're really a busy guy. I think the amount of information that you have provided to me and the insight that you have and it really comes down to your experience and what you've done. Thank you so much, I really appreciate your time.

Respondent: My pleasure. Thank you so much.

Interviewer: That's it. Thank you.

Respondent: I'm glad I could help you.

Interview **7**

Occupation **Chief Information Officer (CIO)**

Sector **Government**

Interviewer: So good morning. This morning I'm at the offices Megawatt Park. I'm here with, who is the ICT. Firstly, thank you, for providing me with your time, I know you're a very, very busy man in your field and I really appreciate you sacrificing this for my doctor's study. So, just to start off, can you give me a brief background of your experience and your role in ?

Respondent: Okay, I'm group executive for group IT and the CIO for. I've been in the industry for 28 years. Of the 28 years I've been in the IT industry for probably 26 of those 28 years. I've been in the current CIO role for the last two years and previously many executive roles in IT from infrastructure to architecture to project delivery to all of those and I've been playing a role in some form in some stage. I've also been instrumental in setting up a number of centres of excellences in IT and one is SAP one. Also set up centre of excellences in IT. There are a number of those that I've set up. Knowledge management, all of those type of things, ja.

Interviewer: Nice, and you mentioned great things there acknowledgement management, centre of excellence, so it will be an integral part of my study. So just to kick it off, how would you define a system? In your view.

Respondent: A system is something that automates a process and it's got a defined outcome. And a system necessarily have a technology at the heart of it, but normally from an automation point of view it's required, but from a system point of view we do things more methodology and also have some repeatable ways of doing it in the future.

Interviewer: Okay. You also mentioned something about integrated. How would you define an integrated system?

Respondent: So from an point of view, we've got various groups and divisions and departments in in its own right, little businesses as it is. So to drive a vision and an combined organisation, we need to integrate these divisions and departments to ensure that we deliver our mandate to our stakeholders. From a system point of view that we share information across systems and link systems. We also standardise a lot of these systems to ensure integration is happening. So, I think that is the core of getting to an integrated way, it's a repeatable way of doing things across the system, which is measured as well.

Interviewer: Okay, fantastic. You mentioned something about sharing information linking and standardising systems. So, I'm going to come back to this, but I think I just to ask you. When you say, standardised systems, what is a standardised system and how do you make sure that it's implemented in the organisation?

Respondent: An example of a standardised system would be a financial system.

Interviewer: What type of financial system?

Respondent: We're using SAP as a financial system and so since inception of we've had one financial system. So albeit various ways of organisation point of view from having one centralised organisation, to decentralised organisation. I think in the beginning before we implemented electronic systems, they all had the STAD system, which is the accounting standards and practises they complied to with paper books and those types of things, but it was still a standardised system, prescribed by the financial institutions. So I think from that point of view, you need to have some direction of what you are content to comply with. What standards you're going to comply with, what industry standards you're going to comply with, and then you put in processes to ensure that those are met. Standardised processes in that matter, 's gone big in terms of going to standardised processes. We have a set of standardised processes for the utility industry that we have developed to a level 3 or 4 for most of them up to task level as standardised process. So, that then has a set of KPIs that you also can measure from how successful you are at following those processes as well. So these things help to standardise it from a system process point of view as well, because you just automate those business processes, that's in your business already. So I think from that point of

view if you've got your standardised processes, you can then implement the industry best practises in that space as well. I think from ensuring that we comply to quality as well, that's a different system.

Interviewer: Quality management system.

Respondent: Yes, that we have also implemented at – the ISO 1001. We've implemented and we've got to ensure we've got these [unclear 34:49] in place to ensure that we manage according to those systems as well.

Interviewer: And it's obviously distilled through the entire organisation. Everybody knows about …

Respondent: We actually have a peer review on different departments on these things and we've got once a year external review from a …

Interviewer: ISO.

Respondent: Ja.

Interviewer: This is a question that's going to come up later, but I might as well address it now. You mentioned something about Level 3, Level 4 and a task. Can you just give me a little more, because when you have these integrated systems, or standardised systems, there's some way that you'd have to make sure that you have to get to a certain level and you've mentioned Level 3 and level 4 and a task level. So can you just give me a little more information on that please.

Respondent: I think when we went through a back to basics programme, at, we implemented these standardised processes. So we had to find them at organisational level, then at the next level from …

Interviewer: business unit level

Respondent: business unit up to the department level and the unit … business unit level. Then the next level of that is task. So, we've got 400 [unclear 33:41] and an engineer or an employee at the plant at the power station for a prescribed way of doing a certain maintenance task. So that's all prescribed and they follow that process to ensure that they comply to these systems.

Interviewer: If I just take it one more step further there please, you say Level 3, Level 4. So what is Level 1, Level 2, Level 3, Level 4? And what is the highest level?

Respondent: The highest level is your organisational level. So from an utility point of view, we've got things like your generation and that will be one form of the process – the generation of electricity. So next level of generation of electricity will be our to actually create that business process into generate processes. Get the call to our, put it on a conveyer and all those type of processes, and they've got different names. I'm just simplifying now. So within that transporting of coal process you then have different, the next level of what some processes, so you then go to the last level of activity level, you get your task and then you get your activity level. That's your standard business process methodology that we …

Interviewer: Okay.

Respondent: If you want I can send you more detail on that.

Interviewer: Can you, please? Because I think that I … I've been to many industries and this is … I haven't seen this. So probably it's academic and it's theoretical as you mentioned, but I think it would be interesting just to get that please. I think it will help in the research as well. Thank you very much. Discuss the type of management systems you have in your organisation.

Respondent: So from an IT organisation point of view we've got ISO from a quality point of view. We follow ITIL and COBIT as well, to ensure that we comply to the industry specific industry things, but then you've got your …

Interviewer: You say COBIT?

Respondent: COBIT. C – O – B – I - T

Interviewer: And ITIL?

Respondent: ITIL.

Interviewer: Okay, just give me …

Respondent: I – T – I – L.

Interviewer: Yes.

Respondent: So ITIL will show you how you do changes in the system. How you lock a request for a new service, how you manage outages in the system. All those standardise IT things that you've done. So it's all standardised and it's also a typical process that you follow.

Interviewer: And COBIT?

Respondent: COBIT is more from an auditing point of view. So it's a control objective for a business IT system. That's what it stands for. It will check the controls in your system. Where ITIL will give you process.

Interviewer: So just to … You said that you're running SAP.

Respondent: Yes. So you have those, but then you also have a certified centre of excellence. So in the last year we got advanced accreditation for a customer centre of excellence for SAP. We are the only company in Africa to have that. But to go through that, they will come and audit you and check if you've got the processes in place and go through your configuration skills and your change management skills, your change control skills and all of those type of processes within your SAP centre of excellence and it goes further, of how you [unclear 30:10] your SAP support staff and get in 365 X 24 X 7 type of support. So, how your escalation methods work so you don't get escalate from [unclear 29:55] for instance. So that you've got it all controlled and management.

Interviewer: Main administrators? Is that administrators?

Respondent: It will go past administrators as well. It will go to your configurations. It will go to your business way of managing business [unclear 29:40] as well. So it's a question of how the satisfaction of your customer works as well. So we've got all of those links into that. So we follow this quality control system which is the ISO and to ensure that we … and it covers things like your customer surveys and how do you respond to those customer surveys. Your system PPIs and your availability and all those type of things. The amount of changes that you implement into the new system, and also the customer satisfaction for those changes [unclear 28:57] that you own. Projects like Amok [?]for instance, to ensure that …

Interviewer: Like a pilot?

Respondent: No. Amok [?]is the management body of …

Interviewer: Oh, like P.Amok [?]

Respondent: Ja, so that, they follow that standard, so wherever we've got specialised skills where we try to ensure that they've got the specialised skills. For architecture for instance, we have TOGAF.

Interviewer: Spell that for me, please.

Respondent: T – O – G – A – F. The open group for architecture forum. So it's also got its requirements on how you do things and to ensure that we comply to these things we also have that in the system. So, every architectural functionality or design is captured in the system. So you can go back three years ago when you implemented the system to check.

Interviewer: Nice.

Respondent: So from a control point of view and from a quality point of view we are big on getting the international standards.

Interviewer: In fact I see … I'm going to need to ask you this question now. Do you ... at which level in your organisation do you integrate and then standardise?

Respondent: So we've got the centralised management of IT, okay? So, everything, if there's a new requirement for instance, it goes to our architecture board first, so that we can ensure that we've got enterprise architecture sorted out, there's not duplication of systems all those types of things from an architectural …

Interviewer: All the checks and balances.

Respondent: Ja, procurement won't buy something if we don't sign it off from an architectural point of view. So then we've got bodies set up with the organisation which is change control forums. We would also then, with the different groups in there, make sure that the business then approves it across the business, so that we get buy-in into that, so that we don't have these pockets of things. It becomes much more difficult these days with the way that IT goes these days where everybody's got the say and everybody's an IT manager and an IT person these days. You can see at home and everybody wants that type of experience it becomes difficult to manage it, so we've got two modes now. We've got a system mode which is your standard traditional way of architecturing things and we typically do it for things that will have an impact across the system. Then we've got mode 2, which …

Interviewer: So you're saying mode 2?

Respondent: Mode 2, which is more flexible in terms of giving the business more agility and it's normally things that you architect and you're willing to throw away after six months, but it keeps the business value and the business [unclear 26:06].

Interviewer: You mentioned something very important there – agility. How do you ensure agility in your management?

Respondent: I think that is the [unclear 25:56] that we are trying to address here. But it's also the things that you implement and the way that you implement things in the future. So integration is one of those layers. It will give you the old way of, you know, the old architectural way of …

Interviewer: The traditional level.

Respondent: Which will … but you've now got components that you can employ as a separate system. But you've got the base of it which is standardised. And then from that point of view you will implement things like cloud and those type of new technologies that makes things much more agile, to actually deliver things on. So software service and all those types of things become more agile. Of course it's still standardised, but the way of trying to do it within a governmental type of organisation with all the red tape and those types of things becomes a lot more cognisant than getting the [unclear 24:58] service across in the organisation. And we've still got a way to go there but we've started in June.

Interviewer: You know, when you talk about three levels, you spoke about the C-suite, executive level, business unit level and operational level. At which levels would you say that you are integrating and at which levels are you standardising?

Respondent: So we try to integrate across the organisation, so standardisation happens at the top level. So you will not get your standardised different … maybe I must explain this with the way that we set up. We've got the enterprise support team, which handles systems that's across the board. So your financial systems and those types of things that's across the board. Then you've got your business systems unit. You might have a different business systems than the business and systems distribution than we have in generation for that matter, because the one does maintenance and the one doesn't. So you've got that specific maintenance system. But all of these standardisations have been at your architectural board level. So any decision goes there. And you would say this is a division specific solution that we implement and we note it as such and we document it as such and we follow that process and it goes through that first initial step before we start to implement it.

Interviewer: That's approval stage?

Respondent: That's approval stage.

Interviewer: Okay, and the second and third levels? I'm talking second level here is the business unit level and third level here, operation.

Respondent: Yes. So, if it's a business system, it will still apply to that whole group for that matter, okay?

Interviewer: Yes.

Respondent: You will not have a specific thing for one level. We have every engineering organisation, so there's a lot of engineering systems that have such, but that's more software than systems. So we still get that approval at the architectural board for that software to be bought and they can then deploy at an operational level.

Interviewer: So then, although it's integrated at the organisation level, it's more standardised at the top level. Okay, fantastic. You mentioned that SAP is the only management system that you have?

Respondent: No, no. So the management systems that we've got a lot of, so for instance, for call log-in and those type of things, we've got the system that we get from T-Systems. It's built on an old remedy type of things, so there's a lot of these type of systems that we have. So, we've got specific systems for log-in and change management and then we've got a specific system for, for instance, for … let me think of an example. For instance, we've implemented a work flow system for handling requests, which is on an electronic form, so all those things are on electronic form, people come to us for instance if they want to buy an asset like a pc, it will go on a form, it gets locked on that. So between the work flow system or log-in system, we track most of the requests on business and system management system for monitoring a specific system like ESP, we will have that same type of things. We are busy now implementing a cross monitoring system, so we've got monitoring systems across as [unclear 21:08] overall systems, and then we've got overall, for instance, we've got Splunk.

Interviewer: Splunk?

Respondent: Ja, to lock requests and also to track certain things on the log files to see if there's a security …

Interviewer: breach.

Respondent: Ja, so there's a lot of these cross system type of monitoring systems that we have. But we are going out now. We are going to implement a total suite now.

Interviewer: Mr Maritz, can I just ask, how many systems – management systems would you say ?

Respondent: I think we try to comply with a minimum of three and a maximum of seven, because I feel it becomes a mission to integrate.

Interviewer: A mission to integrate, yes. I'm just thinking now. How do you go about integrating, because SAP will have to integrate with probably your call logging and your … because how does security actually?

Respondent: So for instance, security the call logging for instance, SAP has its own call logging mechanism, but this centralised call logging will then pass this information to the SAP. So, from an integration lay point of view we are using the Oracle system to integrate all these things for us. Same with Splunk. Splunk will go into the SAP database to extract these log files and also to track any changes in that system.

Interviewer: And all of these systems have to be integrated. So they have to talk to one another. So you also mentioned Oracle. Oracle do you use it for HCM or human capital management or just?

Respondent: No, no. We use it for our database and then also for our integration system. And then apart from that we're using it for our billing system as well.

Interviewer: And your SAP system?

Respondent: Our SAP we use for finance, HR, maintenance …

Interviewer: Because of the number of modules.

Respondent: Ja. Maintenance we're talking about power station maintenance.

Interviewer: Okay, because it has a module on that.

Respondent: But distribution uses a different maintenance system. They're using the IBM Maximum. But I think the integration goes much further than that because if you go to your field force which goes out to fix the staff, we're actually sending to a mobile device for them which they get to [unclear 18:43]. So this integration is the bond that keeps everything together and we're just busy with the upgrading of that. We've been using CBL which was the old SunSystem past which Oracle bought at a stage but they never maintained it, so we're going to then at the latest integration [uncertain of preceding clause 18:21].

Interviewer: So you're looking for a different supplier?

Respondent: No, no, we're working with the supplier.

Interviewer: You're working with Oracle, okay.

Respondent: Things like [unclear 18:12] payments, where SAP took two days, now it take 15 minutes.

Interviewer: Okay, so that's a big …

Respondent: So there's big advantages to that upgrade.

Interviewer: How do you handle multiple systems in your organisation?

Respondent: So we've got a [unclear 17:49] organisation, and we've got specific people looking at the different systems for that, but they're then controlled by an overall manager. And from a management reporting point of view, we've got an operations meeting once a month to ensure to review any incidents and those type of things that happened. Obviously we've got a weekly operations that we do, this is at the executive level and we've got dashboards on these things that runs all the time. So [unclear 17:19] loads and those type of things will come through way before it becomes an issue.

Interviewer: So are you involved with that? An alert? Does it give you an alert, or escalator?

Respondent: Escalator? Escalation level.

Interviewer: Escalation level. Describe the policy of integration in your organisation.

Respondent: In what sense?

Interviewer: Integration policy? Do you have an integration policy? Because you have said something about the different levels, you have an architectural, procurement, control form …

Respondent: So I think, when you talk integration, has always been a top down structure. Also, we prescribe at the top end the business more fuller. From that point of view the accountability and delegation of authority has been given to the architectural board to make major decisions precedent, so you'll have your monthly architectural board meeting, which will look at the overall integration of things. From new requests point of view and then if the new [unclear 16:18] starts, then we will have a project running with that, but you will have various stages of architectural review of that as well to ensure they comply with integration rules and your architectural rules from any sign of that implementation.

Interviewer: So this is just a process forum. Is there a policy? Like you would have a quality management policy to say these are our goals, these are our objectives?

Respondent: So there's an architectural principles document as well that describes the policy. We've got policies in terms of what things will be … what is required to go to architecture for that matter. We've got a review at our Exco level as well to say, this is the progress of IT, this is the value of IT that's been delivered. And if there's any disconnect between the integration at the level of the normal operations, it will be escalated to that. Apart from that we will then [unclear 15:15] that to board as well from the point of view of this is the projects, how we're featuring on them. So we need to keep from an investment point of view for instance, you will not get your investments … we've got different phases of our project: Pre-feasibility phase, etc. and you will do certain of the architectural artefacts in that, for instance, your business case, and all those type of things. We will go through that stages and building onto your architectural document. All of that is prescribed by the policy.

Interviewer: Oh, okay. That's great.

Respondent: A new thing that we've introduced now, is a [unclear 14:31] steerco as well, which we've a whole of the organisation's senior executives to actually review the projects as they go along as well.

Interviewer: So they are a part of it and they know exactly what's going to happen. What were the role of senior and top management regarding management of these systems?

Respondent: So, obviously we've got a service level agreement with all of these [unclear 13:54] and in that service level it describes the outcome that they want. The KPIs will be in that service level agreement. We have set up a customer interface with each of these groups, so we've got your manager for relationship manager for distribution and relationship manager and then they'll have underneath them a lot of relationship managers for those different operations in that division. So that we've got this contact with them to get their requirements and to ensure that we've got customer satisfaction going.

Interviewer: Nice.

Respondent: Ah well, it works most of the time. [unclear 13:07]

Interviewer: But it's nice that you have that so there's support especially if those people at the lower levels don't get the support from upper or middle management then you're definitely going to have problems. What would you say in your view and experience are the challenges of management systems? The integration of management systems?

Respondent: I think the management systems as it is, is based on proven record of how to do things, but it's based on the old way of the old way things were done.

Interviewer: Traditional ways.

Respondent: Traditional way of systems, because the new way of getting more agile and becoming more a changer in the business process for business organisation for instance of course. If you look at IT, it's still number one for change the organisation [unclear 11:56] and all those type of things. It is the biggest disruptor for the organisation. But if you stick to the old management systems, you will never disrupt the organisation in a positive sense and I think that was the purpose of these things that there's no disruptions. So you need to get some agility into these management systems, I think that finding your feet to get some balance and agility or way of doing this agile management is the challenge right now. I don't think all these management systems have been keeping up with how we have are moving. If you look at cloud and [unclear 11:19] service and all those type of things, it's quite a different way of doing things. We're actually outsourcing now to some of the management systems and the question now is, how do you manage that from within your organisation? It's not your responsibility anymore, but you still need to have the control because you're still accountable. So that challenge in a contract management becomes much more detailed now of how to manage these things and what they need to comply with. I had a discussion with a journalist the other day of introducing cloud for instance, globalisation might be a stake in the company because you need to comply with a lot of governmental things now and cloud doesn't fit that. So how do you overcome that? Because you're giving away some accountability and that doesn't go well. So there are ways to do these things, but you need to adapt and change your management system to allow for it. So I think it is a challenge and it's fairly new from creating a new methodology now and people are always pushing these new acronyms at us and agilities one of them and bi-model …

Interviewer: Bi-model?

Respondent: Bi-model. It's two ways of running the business. The one more standardised way and the other to be more agile.

Interviewer: Ja, because both of them have their challenges and benefits.

Respondent: I think if you go back to when we had service orientated architecture, you define these services as components that you have and it failed dismally of course. Systems wasn't right, but now if you look at cloud and all those things, we actually have adopted that

service orientated architecture. We have to and that is the success of integrating new systems. The principles of service orientated architecture is actually how you want to integrate.

Interviewer: Integrate, ja, sure. What about change management? Do you find that?

Respondent: Obviously there's a system change management and a people change management. So from a system change management, we've got a thorough policy process of documenting, preparing [?], having it approved at a certain level before it gets implemented. And the purpose of that is to look at the integrated impact of that change in [unclear 08:37] life, because if he doesn't implement changes all the time, three years ago we had a lot of changes in the system and we had a lot of chaos in the system. So we've implemented this whole new way of change management. So, we look at the impact, the knock on impact on other systems and also too many changes on the weekend looking at the extent of those changes from resources and all that type of thing. So we're implementing more changes now, but it's more controlled and it's more successful than in the past.

Interviewer: Is it more standardised?

Respondent: Ja, so we've got a 99,9% success rate now in change management.

Interviewer: Fantastic. Because you are standardising at the operational level?

Respondent: Ja. And we adopted [unclear 07:48] so we don't have all these conflicting changes happening at the same time and you don't know what went wrong.

Interviewer: And the people in change management?

Respondent: I think, we're still a governmental organisation, I feel we still have a long way, it's not just a top down [unclear 07:32] but the new thing that we implemented is a that we've … We've always had a change management stream in the past, the problem is that we allowed business people or our own people to drive that change management there, it's a much more specialised skill than that, so you need to get that skill on board for your projects to [unclear 07:12] success.

Interviewer: So you say that skills are also a …

Respondent: Ja, look, it's a specialised type of skill, so there's a lot of those skills in the market, but you might not find them, you can't just make anybody a change manager.

Interviewer: Yes. Because there's too many principles involved. What about risk?

Respondent: As an organisation we're very much risk averse. All these processes that we've got in place. For instance, before you start a project we've got to have new investment approval and they won't approve it if you don't have a positive business case and then you have this risk module that you need to implement as well to manage the risk and report on. Each project has got its risk and reporting that needs to be done. We also have, from a risk management point of view, we have a system in place to document the risk. To track the risk. Not just the system, but any risk in the organisation. It get's on the response system and it gets a report and at each Exco level we've got a sub committee that looks at the risk.

Interviewer: Nice. Shoo.

Respondent: So we look at that even from a point of view of a total country blackout. That whole management process like that we've got a process to handle that as well. We call it a ERC – emergency [?] response committee. So we've got different levels of risk and they probably get risk from the point of view of all of those types of things as well.

Interviewer: Okay.

Respondent: [unclear 05:27]

Interviewer: That's the worst case scenario, total blackout of the country, so you need to have a … We spoke about the … let me just ask this question here. How do you determine the majority of integration in your organisation?

Respondent: I think that one level is to look at the number of conflicting systems that you've implemented. Not just IT systems, different systems that manage the same process on across the organisation. From that point of view we've got a standardised set of processes across the organisation and if you're outside of that you will get audited and will be reported on. So, apart from that, from an integrated system integration point of view, we look at the minimal, obviously when we implement it, we design from start, how to integrate and eliminate duplication. So that principle is an architectural principle to reduce duplication. That will get tracked as well, and then also, from a success point of view, you look at your failures in integration from a system point of view. Of course if you've got failures, you will for instance – we had a lot of problems as well with our prepaid electricity. Of course it's a huge integration, of course it goes to your maintenance, it goes to each system that you can think of it will go to, your HR system, everything, and when this integration doesn't work, they will go to a system down status where they do everything manually. So, that's the backup for the server, it's a manual process type of thing, and you will measure your success on how many times you will go to [unclear 03:33].

Interviewer: You mentioned something about auditing, because to determine the level that you are on, you would probably have to audit yourself to see, okay, we need to be at Level 3 and … At which level would you say is at?

Respondent: is at least on Level 3 and most of the organisation have gone to Level 4 and Level 5.

Interviewer: Is it? Okay. So, level 1, level 2, level 3, and level 4.

Respondent: Level 3 will define the process. We've got our document process and then level 4 we go to the activity, but I'll send you the [unclear 02:54]

Interviewer: Okay, sure. So you say that most of the organisation is on level 3 and level 4.

Respondent: They must be at level 3 and pushing for level 4.

Interviewer: Okay. I think just in trying to conclude, what are the factors in your view I should address that are not highlighted in the study thus far?

Respondent: I think I've touched on it previously. I think that the new organisation, or the new way of doing systems is significantly changing as we [unclear 02:12] on the future. There's going to be a way of taking the organisation to new heights, or the organisation will not deliver in future, it will dissolve and if we do not allow these new systems to actually describe the new organisation, it will fail. Even in a company like which is a government company, you don't think it will fail, it will fail. It will actually disrupt the countries political state. So the way that you deliver things becomes very important in the future and if you do not have that systematic way of … you might just touch on that angle.

Interviewer: Fantastic. Mr Maritz, thank you so much for your time. I really appreciate it, you're a really busy man, you have given me a lot of information, and I'll take this [unclear 01:18]. Thank you very much.

Respondent: Just drop me a mail to ask the questions you want.

Interviewer: Just a last thing, on the very last thing. Because this study is both a qualitative and quantitative study, so at the moment it's a qualitative study, meaning that I have face to face interviews, the quantitative side involves sending out a survey. Would I be able to send out a survey to yourself and probably you could send it to the people that … it's a very generic survey, it has about … it will take you about the employees about 15 or 20 minutes. In the ICT and management systems area. Would you be able to assist me on that?

Respondent: Ja well, we will just have to look at what is the topics and …

Interviewer: It is a very generic and … Okay, thank you very much.

Interview **8**

Occupation **Chief executive officer**

Sector **ICT**

Respondent: For South Africa. We have about 225 employees in South Africa, head office in Johannesburg. I've got offices in Cape Town and Durban.

Interviewer: In terms of your structure in your organisation?

Respondent: So we are split into key domain areas of work product lines, which is applications, technology and the systems. We have evolved into an application into a cloud, as a cloud company in all these three pillars, being the only vendor that has got an integrated, a full suite of integrated cloud solutions from softwares and service. Platform as a service and software as a service.

Interviewer: Just once again, thank you Kholiwe for affording me the time and the opportunity to interview you. I know that you're a very busy lady. I just have a set of key questions that we'll go through very quickly. How would you define a system?

Respondent: Pardon?

Interviewer: How would you define a system? What is your view or your perception – what do you think a system should be in your context, in your organisation?

Respondent: As it relates to?

Interviewer: You can say in terms of integration, integration of management systems, let's make it a bit more easier that way, because normally if you look at a system in the body, you have a digestive system and how the digestive system, or you have a nervous system. How does the system actually, what would you define as a system in the organisational context?

Respondent: For me, the key to align to our solutions would be how they talk to each other.

Interviewer: Yes, true

Respondent: It's the alignment of the parts if you talking from a body system and with how we've built our systems and acquired systems over time for an integrated financial management system is pre-built configurations that will allow seamless implementation for our customers in a simple aspect.

Interviewer: So if we say, and I can align to some of the things that you are saying in terms of how a system should work, working together and how they talk to each other. If you're looking at an integrated system, how would you define that? An integrated system?

Respondent: If you're looking from an application to ERP, that integration is the whole value chain of your application. If I simplify it into supply chain, from the order to pay process, how that flow as it's defined in the process is enabled in a technology aspect as to what you start from the beginning of that process to that end process in the cycle, that will talk to that. And if you're looking at that full suite, whereby it's your CRM, it's your financials, it's your supply chain, how they all fit into that chain, right up to the reporting line. That is how I would define it in simple terms.

Interviewer: The management system. It's the last concept I just wanted to get your view on. How would you define a management system?

Respondent: Well it would include all those operational pillars.

Interviewer: Yes, operational pillars?

Respondent: Yes on the, when you talk back office and all that but in the link of your management system, it would be your reporting capability to your analytics capability, if I'm getting your view.

Interviewer: Yes.

Respondent: The system that will enable management and executives to have certain analytics, productive analytics about your organisation so that will include the engine of your

reporting, your scorecard capability and your analytics for you to forecast for the future business as well as understanding that past engagement. I'm not sure if I've captured everything.

Interviewer: I think you've already mentioned some of them. You mentioned your CRM, your financials. You also mentioned your supply chain. And I think management systems and one theory is saying as well is that it does cover the ERP systems as you mentioned, your forecasting and reporting, because it's critical for management.

Respondent: The intelligence of that question is what is the desired state in the strategy of the organisation in implementing these systems. Yes, it's for the efficient running and the operations but also as an enabling decision-making process to take you to the next level. If the data, the intelligence, you can't extrapolate the right intelligence off your system it becomes meaningless.

Interviewer: Meaningless, absolutely. You mentioned something about efficient and efficiency. So efficient being efficiency. Effective meaning that you are achieving your goals.

Respondent: Yes.

Interviewer: Kholiwe, can you please tell me what type of management systems you have in your organisation in terms of, in light of what you've just explained earlier?

Respondent: This is where I think, for us, it is, can either be seen as a complexity or a choice to our customers because we've got all, as I've mentioned, we are an integrated platform organisation. Right from your ERP down to storage or should I say down from storage up to the application level with a layer of that with the transitions to cloud, so we acquired a few years ago some microsystem which covers your storage, your disc and it talks to your core technology which is where originated with a database and your fusion middleware, which includes your service oriented architecture, your business intelligence.

Interviewer: Yes. When you talk about architecture?

Respondent: Yes

Interviewer: What is this?

Respondent: The SOA

Interviewer: Sorry

Respondent: The SOA elements, the Service Oriented Architecture, which is more your integration of your technology to your applications. And then your ERP which we have segmented in simple terms to your CRM which we call it customer experience today, your enterprise which are financials and then your supply chain and your ACM system so we have …

Interviewer: HCM? What's HCM?

Respondent: Yes, Human Capital Management system. So you're talking a broad in the three pillars that I've highlighted: your applications, your ERP …

Interviewer: Technology and system

Respondent: Yes, so your applications would be your ERP, HCM, Supply Chain, your financials – that is in the platform of the applications, and then we've got a layer of …

Interviewer: In terms of your management systems?

Respondent: Yes. And then we've got another technology layer as an underneath pillar.

Interviewer: So in the technology layer, do you have management systems there or, because I'm looking at this ERP, HCM, and Supply Chain and Financials, more at a strategic level or it's filtered through the entire organisation?

Respondent: It's filtered through. But on the technology we're talking fusion middleware, it is that integration layer as an architect that will glue systems together, because how we build, we are built as an open standard, okay. SAP traditionally is built on for technology. The engine we use is that core layer of your fusion middleware and integration to ensure the effective suite of integration in that space.

Interviewer: So when you say fusion and integration is it one and the same or is it separate terms?

Respondent: It's separate terms but in one platform.

Interviewer: Okay. Describe, how do you work with multiple systems in your organisation. How would you work with these different systems in your organisation to make sure that they actually talk to a management system? So we're talking about ERP, HCM, Supply Chain and Financials.

Respondent: We're one organisation that we eat our own dog food, we are implementing our own system so we are running our own financials, procurement system and they are all fully integrated with a single sign-on so I log into my sign-on on the system, I've got access to the information that is assigned to me with security standards obviously.

Interviewer: Security standards?

Respondent: Ja

Interviewer: Kholiwe, see, if you've identified a new system that needs to come into the organisation, what is the process of managing that new system or management system into the organisation? How do you actually go about doing that?

Respondent: For an organisation you have to identify your needs. Firstly your needs because I think we're going into an era where products have become similar and therefore what are your key needs as an organisation, business needs that you want to attain by bringing the system, moving from manual or to automation, that is the first and once we've identified that, the processes - aligning of your architect and your 'to be' processes to the solution because before you can go and choose any management system, we need to ask our client what is your 'to be' state and what is your architecture that you aspire to get to, and then technology brings in a fit of as an enabler and if it fits into what your requirements are you are able to map seamlessly your requirements as how you can convert and move from, whether it's your legacy system or whether it's your manual system, into your technology.

Interviewer: You mentioned an important term there I just wanted to take you back to that – processes. So just give me a little more information on this, when you say that it either has to be a manual or automated processes and you said some processes goes to architecture then to a solution.

Respondent: Ja

Interviewer: Just take me, just give me a little bit more on the processes please.

Respondent: The flow if you, let us talk about your supply, your procure to pay

Interviewer: Procure to pay.

Respondent: You know you need to be able to outline what gaps, what areas of improvement you need within that process and whether the system will be able to cater for your future state of your business. And at what level are you defining those processes for the system to cater for, as an example, we did an exercise with one entity in outlining that.

Interviewer: Entity?

Respondent: One of the government entities that we just won a process.

Interviewer: Ah government

Respondent: Not government necessarily, but we had to look at their current processes and the 'to-be' state of the processes and fit the processes to the system, that's what they wanted to do. What we were able to provide is that our system, because we have invested in huge R&D, for our solutions, we almost cater for all the industries and businesses in terms of the vanilla implementation of our solution, there won't be any need for any form of customisation. So we are able to prove their 'to-be' processes that they may not require when they, that will be enabled through the system and what they need to improve in terms of their systems to implemented.

Interviewer: So essentially you've identified a gap.

Respondent: Yes

Interviewer: So you know where you are presently, you know what the need of the customer is and then through that.

Respondent: Those are the leading global practices that will take you to that next level.

Interviewer: Okay.

Respondent: So we come in also providing that, rather than say, "that system can work". We do need many proof of concept not necessarily because we pride ourselves that we've done and invested over the years billions in R&D to ensure that all/most organisations will have the similar requirements that won't require much of the customisation.

Interviewer: Interesting. An example of a process would be? When you said you've identified a gap? So obviously in that gap you're addressing a process?

Respondent: Yes

Interviewer: So what would that be? Would you say operational process or?

Respondent: It can link to the operational.

Interviewer: The standard operating practice, work instruction?

Respondent: It will be the multiple of those, from this one step to another step, what are those requirements. Cash management, what is the process that is required, which is your basic process in that space.

Interviewer: Interesting. What is your view on, probably there's three parts to this: integration, standardisation and combination? What is your view on, you've already alluded a lot on integration so probably you stand very firmly on this, but obviously with management systems, it actually filters down from leadership, then it goes down to probably business unit level and then to an operations level, so looking at integration, standardisation and combination, where would you see these concepts in your organisation? So integration, standardisation and combination. If anything?

Respondent: So if you talk standardisation. How many offices have we got, we've got about 48, we are in 48 countries, I don't know how many offices we have, the processes are standardised across.

Interviewer: So is this at an operational level? Business unit level or right across?

Respondent: Right across. We standardise if it's a procurement process of how to get your contracts out, there's a global metrics that is implemented across, so it's not as regional yes, you cater for the local requirements of the market but we've got a standard.

Interviewer: So you standardise the process.

Respondent: Yes we standardise. Process of approval for our licences, it is global, standardised.

Interviewer: So where does the integration part come in?

Respondent: The systems talk to each other in terms of that integration layer. Now it can be a simple form of me delivering a service to you from the web code, once you've identified the need of that system through a process of generating a web code for you, once you approve that web code, you've got your own internal approvals in the system from your company, that we generate an ordering document that you're going to sign on. That ordering document has got an integration layer to the legal team who will review that process and from that part, it comes to you for signoff. Once we receive that signoff, it's a question of generating the purchase order which is more of a monetary contract to you, so all that process, as much as it's standardised, it's also integrated, because each process will feed into the next and it fits into the next. Now is it ready so that your checks and balances are all automated in the system, that it's good to go and it is a tick for submission of the system.

Interviewer: And obviously the one process cannot go into the next unless there is approval.

Respondent: No.

Interviewer: So you say that's how it's integrated. And standardisation is what you'll be doing in South Africa, it's exactly the same in the US, the UK …

Respondent: That's it. There will definitely be those requirements where the local, the localisation will be required i.e. your HR.

Interviewer: Oh yes, sure.

Respondent: Obviously with the pay legislations and regulatory there will be …

Interviewer: country laws,

Respondent: country laws, that you need to localise specific to that industry but from a basic HR system, it is generic.

Interviewer: What would you define as combination? If I can ask. Combination in systems management?

Respondent: I'm not sure if that would link into what we've just discussed, that you will have the unique local requirements vis-à-vis, what will be a global standard practice that is standardised across all the countries plus what would be the local requirements that you need to cater as a geography, as an organisation at a geographical level.

Interviewer: So in essence, if you're saying that a combination is the local, the unique local practices and the local requirements, is there a policy? Or maybe I should phrase it this way: Describe your policy on integration in. Do you have a policy on integration or is it just taken for granted?

Respondent: No, no we do.

Interviewer: Oh fantastic.

Respondent: We do, it's just that I'm not sure, can you hold that as a question …

Interviewer: okay

Respondent: We definitely do have that policy of integration.

Interviewer: Ok, you have a policy.

Respondent: We do have a policy but in terms of giving you an outline of it, I'm not sure …

Interviewer: No, no that's fine so I think the first thing is to identify that there is a policy on integration so it's at a very strategic level and obviously everybody in the company knows how integration works in the company. What would the role of senior and top management, regarding management of systems, what is the role of management and senior management? So senior management is probably your MDs or your executives and then management, be in terms of management of systems, what is their role?

Respondent: It's in the leadership and the direction.

Interviewer: Yes, leadership and direction.

Respondent: And I think it's more for providing that direction in terms of ensuring the execution, the successful implementation. I don't think there's any system that can be implemented without the leadership taking that ownership of a system because therein comes challenges of change management and if the voice of adoption and embracing the implementation of that system is not at the leadership level, then the generic framework is not going to be followed. So spearheading that process and providing the right level of direction, because that on its own can be seen as a transformation on its and it needs to be owned at that leadership levels to be able to filter and ensure, though there will always be challenges in any transformation and system implementation, management system, but if the ownership and the guidance is taken through from the leadership, it becomes key.

Interviewer: It becomes easier to maintain and manage. And senior … and management? Just to pose the question, what would the role of top, okay, so of management, regarding management of these systems, so we discussed senior management, we said, you mentioned important things like change, is culture an issue?

Respondent: Culture is always, it's I mean think about if I'm talking integration, I'm talking standardisation, the policy on that coming from the global, to ensure that it's embraced, it's not a painful execution. The ownership at the senior management to take the management thereof to ensure …

Interviewer: to hold their hands.

Respondent: to hold their hands and ensure that it's executed and that requires management to be fully involved in that process because it can just be an email moratorium that is coming from the top but if it's not embraced by management to say we have got to do this, these are the benefits of us doing A, B and C and we need to change and this change will lead to this specific outcome goal, it will be adopted. I'll make an example, as we move to cloud, we will have certain resistance in terms of whether the market is ready or whether our customers are ready to embrace but if you look at the of cloud that will enable customers' efficiency and agility in getting to the market, you will have your team resisting to take this new strategy forward but if you're talking the leadership as the management and the execution, in showing the value thereof, that adoption becomes more easier. What I normally do, I go with my team to be the voice of presenting to the customer first so that they can see me as the change agent rather than we've got to do it without showing me the way and I will be able to follow, and once they are brought, bought into the solution it becomes easier for them to embrace and take it forward.

Interviewer: Would I be correct in saying that, by you enabling and moving the process forward and being part of the process, it actually makes it easier for?

Respondent: It makes it easier. Because they want to look at the leader to say, is it just a lip service because it's instituted at corporate or do you really believe in this strategy. Once you show that capability it becomes much more easier and how you articulate it becomes much more easier. Traditionally, if you're looking at the management systems, ERP, HCM, CRM, HR – were all in one. In the sense that as an integrated solution but we also offer you as a customer the opportunity that because our solutions are open standard, you can procure CRM as a module and later on HCM or maybe in another system in HCM, but be able to procure my solution because what we bring to the table is that it's pre-integrated, those can talk to each other. Now with my field sales team, I had an ERP sales, CRM, HCM and your finance, which is the ARP. How do I articulate that proposition to my customer? The specialisation, because each domain module requires the specialisation and full understanding of the architecture underneath the solution, that's what I'm giving you. You may see many representatives coming through to you but the audience becomes different because here I'm talking to the chief marketing officer to outline the process and the value of the system. Then I'm going to the HCM, to the head of HR, I'm going to the supply chain, finance and then at the end of the day the IT. Once I've sold to business and articulated the business need of what my solution can provide that as a specialisation.

Interviewer: It's a unique selling point.

Respondent: It's a unique selling point that we are able to see how this then I've got now the enterprise architect which is going to show how these pillars integrate and talk to each other and that as a solution that is a simple sell, but sometimes if I'm not able to provide that to my team to say here is a selling point that provides service to my customer, because in the market today, I'm competing on the CRM space with SalesForce.com and Microsoft, no longer competing with SAP. I'm only competing with SAP on finance. So I'm providing you the value of benchmarking and the capability of the system and we aim now to have a choice of whether this will be integrated as a solution or in a separate space as we move to the cloud. But if it's just in that form that, I see a lot of people coming here without articulating the value of why it's bringing to you as the customer, then that value is not shown, so I need to be able to be that driving force with my team to be able to articulate that.

Interviewer: What a fantastic example, thank you. You know it really makes sense and it seems as though that you really have to identify a unique selling point in order for the other modules to actually fit in.

Respondent: Yes. And I think even within the organisation, the change that comes is, because we've been a traditional core database business, we have built our relationships with the IT, we have evolved now to get to the C-Suite because the users of our system is the procurer of the systems becomes IT but, who are the users? I need to go and the practitioners who must see value, so to them we're not going to be talking about CPU's and codes, I have to talk about the value and the outcome and the benefit of the system. Once I position that, it becomes an easier sell for adoption even in the organisation for change management that it's not just a system that are sold by IT to business, but we are able to show the full size of the solution.

Interviewer: So true.

Respondent: So that is, it becomes a journey on its own, because people are so used to selling what they are comfortable, but how now do we evolve?

Interviewer: The transformation.

Respondent: In that transformation.

Interviewer: The transforming. It's always not selling to the C-Suite, because the C-Suite only wants the management system. It's a management system and they say it has a report that comes out and the IT guy assists in getting the report out but the people that are actually inputting the data, that's where it is actually.

Respondent: A few years ago I was doing the implementation to Government. We had to go through the districts to create and show the value to the bookkeeper who is punching …

Interviewer: The figures in …

Respondent: The receipts that they get. Because junk in is junk out …

Interviewer: Absolutely.

Respondent: So once we were able to articulate to say, "Do you know how important your role is?" because at leadership, when they interpret that report, they are interpreting what has been fed into the system, but what we realised at that point is that this person, on a day, would capture receipt number one to receipt number twenty and skip twenty to forty five for some reason because she wants to end the day and move. Do you understand the impact of the reconciliation of those thirty receipts because it's not traceable? The moment you articulate then they're able to see.

Interviewer: Conceptualise it.

Respondent: Conceptualise it - that actually I'm impacting the bottom line by not doing A, B and C. They may see their job as this small, but in the bigger scheme of things we've got to be able to articulate and I think that talks to how we communicate and make sure that in each of the value processes and the system, everyone is important up until the end chain.

Interviewer: Alright. Just a key ingredient in any organisation is the communication.

Respondent: Communication. We underestimate it, but we can simplify it without being much complicated.

Interviewer: What recommendations can you offer in terms of the study so far? I have now asked you a few questions, what would you expect differently that maybe what I've asked here or maybe I can ask other interviewees as well? Maybe just something that you maybe picked up because you mentioned important things like communication, change, culture, strategy, policy, efficiency. So those were the key things that actually came out from that. Is there anything else that you would want me to address in terms of?

Respondent: I think to those key points the speed to the market now becomes another key element, maybe depending on which industry, but in my organisation, the speed becomes critical because it also …

Interviewer: The speed and efficiency or the effectiveness?

Respondent: From the agility, the speed to the market, so for me getting my products and solutions to the market is critical in my space, from the product development to the execution and getting it into the market.

Interviewer: So you're talking about lead times?

Respondent: Lead times.

Interviewer: So in terms of a solutions-based organisation what is the normal lead-time for that? It depends on the customers need.

Respondent: It depends on the customers need, but for me, my main objective is to enable my customer through my systems, to deliver on their set of objectives and achieve their KPI's and whether it's profit, growth, whatever, to the customer, if I'm unable …

Interviewer: Yes, then you are failing.

Respondent: I'm failing. So that is that speed for my customer to be able to …

Interviewer: Deliver on their goals.

Respondent: On their customers I mean consumers today are sophisticated, they know what they are looking for. Now you have UNISA, how quick you do your registrations. A few years back I would come in and spend my day …

Interviewer: So you're talking about efficiency now.

Respondent: Yes. I'm getting to the UNISA, I used to give myself a day to say okay, I'll do my registration I'll take a day. Today's kids they don't have that much time and offering your services online, can that person on the go be able, whilst they're at the airport or at the bus, they are able to do their registration. That is a part of efficiency but also the speed in getting those done. That means you are attracting more students into the university and the outcome will be you know, so if the systems are unable to do that for you why choose it, hence I was saying what is the business need for you to go to the market, to be looking for that kind of system? What is it enabling you, because even if it's not expediting the process for you to deliver to your consumer, then the value out of it will not …

Interviewer: Will not be realised.

Respondent: Will not be realised.

Interviewer: Absolutely. Last question for you Kholiwe, please. How do you determine the maturity of integration in your organisation? How would you define the – do you say ok you have a level one, level two, level three and if you say, level one is that everybody in the organisation understands integration, you have your documentation aligned to integration policy, or Level 2, you might say that there still needs some way to be, to go in terms of – how do you develop or say that you know, my organisation is a certain maturity. Maybe if you want to say from one to five, maybe you're at three, and three being that you've done the orientation, people are aware of what's happening, the documentation is in process. Do you have something like that?

Respondent: I would imagine we're at the maturity stage where there's level 6 or 7. I would say very mature, because our product development team will outline the new system to be implemented, will come up with a process flow, web training online, for execution and the follow-through and ensuring that the teams are registered and that the training material, the advocacy of it, so it becomes a programme on its own when you are going to launch a particular system.

Interviewer: management system?

Respondent: A management system, to ensure that globally we are offering that service and enablement to the teams from the processes, right up until the execution before it goes live.

Interviewer: How do you make sure that it's actually implemented? You said from web training through to the processes and I'm just looking for one thing from you here Kholiwe, because this is an entire process and then how do you make sure that everything is ok?

Respondent: I think it's also in the base of the outcome and the checks and balances on …

Interviewer: How do you do the checks and balances?

Respondent: On the system, we have the monitoring mechanism within the system.

Interviewer: So monitoring mechanism, is it people driven or is it a specific department that makes sure that everything is following through?

Respondent: We've got a business operations unit that is driving the review to ensure …

Interviewer: So they do sort of an …

Respondent: Analysis

Interviewer: Audit?

Respondent: It's more of an audit spot-check, audit, i.e, if we're conducting training for that period of time, it's two weeks, we want to know how many employees have done the training, are they at the efficiency level for them to …

Interviewer: perform

Respondent: perform and the specific requirements i.e. on training that maybe if you've done this training you don't have 100%, you cannot proceed to the next level. So there will be all those checks and balances that you will have to redo it until you are at the proficiency level for you to move to the next level. So that kick within the system comes in to ensure that your level of readiness is there before you get …

Interviewer: Does it come with a certificate, or is it?

Respondent: Most of them come up with a certificate.

Interviewer: Certified.

Respondent: Certified. Some are more online. Most predominantly for your architects team, definitely the certification of your delivery teams.

Interviewer: Kholiwe, firstly or lastly, thank you so much, you know I think we've come to the end of the interview and I really thank you for your time. You've given me important information I can really use in my study and it has been really a pleasure and I really thank you so much.

Respondent: Ok, do you ever consider sending these up front so that you've got much more, because also certain organisations have put restrictions on certain areas. What one could do, if you're fine, I can elaborate on those through the email and you can align it to what I've already covered.

Interviewer: In fact I, can I do that?

Respondent: Yes.

Interviewer: Absolutely. Thank you so much. I think I just need to ask you just in closing, and then as you know, Kholiwe, within education, especially at a doctorate level, you have a qualitative part. Qualitative part being where we have face to face interviews, structured interviews though, and we also have a quantitative part and the quantitative part involves normally a survey that goes out. Can I send you a survey that you don't have to answer, that you send it out to your managers and your practitioners as we've mentioned in the study, to give me feedback. It will take about fifteen to twenty minutes of their time but this information will be used to consolidate my framework.

Respondent: You can do that.

Interviewer: It will be fine?

Respondent: It will be fine.

Interviewer: Thank you so much I really appreciate it.

Interview **9**

Occupation **Chief Information Officer**

Sector **ICT**

Interviewer: Good morning Johan, thank you. This morning I'm here with Mr Johan Bosch from Microsoft. Firstly Johan, I really appreciate your time. I know it's really difficult to get hold of you guys, but the fact that you have sacrificed an hour for me, I really appreciate it.

Respondent: It's a only a pleasure.

Interviewer: It means that you want to move the education agenda of South Africa forward. I really appreciate that. Thank you. So, just before we start. Johan, can you please give me an overview of your experience and what you're currently doing at Microsoft South Africa and we'll take it from there.

Respondent: Okay. So, very briefly, I started out in IT after my initial studies way back in 1984 with Allied bank, and were a network operator to start with and I learnt networking the hard way and were the first person in South Africa to install IBM 40 to 70 pc, and install a Cisco router afterwards and were actually had the privilege to go and visit Cisco when they were still selling breakout boxes out of a garage in San Francisco and then I started to build IT companies, so I built Atio Corporation. Still in existence today. I'm still a big shareholder in Atio Corporation. They made name in the early days for the process of telemetry and the whole integration of voice and data. That were the early days and then became a general system integrated general licensed partner for a number of players. Then moved from there into my overseas ventures and sold Africa.com to Yahoo and spent some time in the US with venture capitalists really building a e-trading portal between Africa and America. Really taking the Afro-American process to the nth degree and really learnt a lot as chief operating officer. Got headhunted from there to Med-scheme and became director strategy in business development for Med-scheme for a number of years. Headhunted from Med-scheme to Barclays and became chief operating officer for Barclays in Africa, but also for all Anskia products. So car products and any other Anskia products were a part of my portfolio for both Absa and Barclays Africa. Decided to leave Barclays because of the fact that they worked 17 hour days and were three weeks out of town every month, but left for, I think the wrong organisation at that time – left for Blue Label and became chief operating officer there. Very dynamic, very interesting organisation, but I couldn't find that the organisation satisfied my moral and ethics as a businessman. Not at all. So in the end, after Absa and after Blue Label, I kind of made the decision to join Microsoft in a CIO position, because I was COO for 15, 17 years before that – as a CIO really because I wanted to get back into how technology leads business, and found myself in an incredibly dynamic organisation and you know, I've been here now for two years, and it took me on quite a journey. I'm in my 4th position in two years. Although the title of CIO gets carried through in a position, there's different nuances that came with it through the four changes. So yes, I'm all ears. Want to help you, and yes, my experience is solid and I know in the industry a lot of people want me to be in a COO role, because I do have a very strong operational framework from which I operate, but I enjoy the CIO role at this point in time, just looking at it from the other side of the coin.

Interviewer: Fantastic. Thank you. It's really nice to know that you have such vast knowledge in integration and your experience as well. Let's just get into the question here. Please provide a brief outline or overview of management systems in your organisation.

Respondent: So, Microsoft is currently going through another stage in their evolution of what we call the digital transformation and this part of the digital transformation from Microsoft is all about breaking down the silos that were created under previous organisational culture and previous organisational leadership. So the leadership, since about ten years ago built a different Microsoft products company and service companies into co-competition with each other and created management systems for every single part of the organisation. So we landed up, when I joined two years ago, we landed up with 57 different implementations of all layers of operational and management systems right across the organisation.

Interviewer: 57?

Respondent: 57. Because of the amount of product companies, because of the amount of service companies and because of this concept that everybody's in co-competition to each other. So you had HR running its own IT and management processes. Own instant of SAP doing its own thing. Finance doing its own thing. At that end, so all of your support areas were doing their own thing but all your product houses were doing their own thing also and the engineers were not talking to each other. It's funny, when you get to Redmond in Seattle where the Microsoft head office is, you actually see it clearly in the physical structures, because the campus consists of about 170 buildings, which is in many campuses. Each has got a different look and feel to it. Each has got a different layout in the building to it. Each has got a different culture in the building, and the one building I don't know about the other. Now I'm telling you this story specifically to get to the challenge around business systems, and specifically management information that stretch across business systems. Now, what I found to be the current implementation is a incredible fragmented world of reports on reports and measurements on measurements. So part of this process of silo business that happened over ten years till two years ago, the only way that the group exec could bring the two groups together was to create common measurements and what they've done is they've created a organisational scorecard that got measured by a behavioural scorecard that got measured by input to a behaviour scorecard and, and, and. So you in the end landed up with an incredible notion inspection and the purpose of the business systems became inspection. The purpose of the business systems were no more any longer a process of "how do we coach the business, how do we strategically look at our business and how do we, through a strategic view, be able to change the way we go forward?" So let me stop there. That's just a start a little bit of an overview.

Interviewer: So with these 57 management systems, how many do you have now?

Respondent: So we in the last two years have done incredible hard work and we've done it both from a macro consultative position, and from a micro what do we need to change position. So we started to say, the first thing we wanted to address is the sales organisation, because Microsoft in essence is a product house and a sales organisation. So we wanted to change the sales organisation. We broke down the engineering areas first of all and collapsed it into three major engineering areas. So 57 different areas in all, how many there engineering areas were collapsed. We then started to get into certain principles and the principles are actually quite important at this stage of the discussion. Principle number 1 is that we will not take a product or a service or an element of business system or management system out to our customers if we don't use it in-house. Okay, so that was rule number 1. From that we decided on a concept that Microsoft IT is Microsoft's first and best customer. Okay, and therefore, if it doesn't work for us, it will not work for any other customer and we then gained governance over the engineering areas. So we've got full governance in terms of what get's developed by our different engineering areas, be it they're working on an activity suite. Be it they're working on a more personal computing suite or on a cloud suite. Whatever they're busy developing. Whatever they roll out, is first of all governed by ourselves and the governance structure around this is for me first of all one of the pillars that we need to look at in our framework. So the framework from my perspective is not about how do we technically align business architecture and technical architecture and how do we create integration layers between them. Not at all. The framework for me in this modern day and age is all about how do we make sure that we create common governance. That through the common governance we start talking the same lingo for lack of a better word around business systems and around management information. And through that, that we can then go for a process, especially in Microsoft to simplify and dramatically rationalise in terms of how we go forward. So where we are right now, we've got one instant of SAP running. We have consolidated all of our sales processes onto CMR online or dynamics products set. We have consolidated most of our business information onto Power BI. There's still some Excel because you know, Excel is the love of a lot of people in Microsoft and the interesting thing in Microsoft is at any time you call yourself one of the thirteen CIOs in Microsoft, you'll also realise you're dealing with 220 000 other CIOs that think they know better than you, so that's always the interesting part of the job. But we consolidated now to a level that we actually now

understand what's where. There's still some low hanging fruit. After two years you cannot break down that what built up over many, many years. And the big thing on this journey, although you've got this car speeding along and you're changing the wheels in flight or the plane is speeding along and you're changing the engines in flight, it's still a 90 billion dollar monster you're dealing with and a 90 billon dollar monster cannot have downtime. Cannot have failures. Cannot have things that do not work. So, you need to be the whole time aware of what you do from an IT agility point of view and what does it do to business agility. So, just the way we've described IT agility is your full agile framework of how do you bring product to market very fast, okay, but from a business agility point of view we still struggled because what does business agility mean? It doesn't mean that we allow teams to not have a plan and to bring elements of solution to the table. And the best way over time I started to describe it for myself and a lot of consultants do use this little paraphrase, this … You don't start up by designing the car and then build the car in elements because then all you're going to have then is a car without an engine or a car without wheels or a car without a steer and none of those cars actually work. You start off by building a skateboard and the skateboard works perfectly and then you build a bicycle and the bicycle works perfectly. The best bicycle there is. And then a motorcycle, and then a small car and then a luxury car and then the best car.

Interviewer: Crawl before you run.

Respondent: Absolutely. Same story and that's really our philosophy in terms of agility also. So the same way we've brought Windows 10 to the market, and Office 365 to the market – if you're a user of those you'll see changes really on a day-to-day basis. That's the way we look at internal business systems also now. Changes on a day-to-day basis. There's no free experience anymore. There's no chain cycles anymore. It is now engineering groups that get together on engineering studios online developing components of functionality and as they flow together we package it day by day to be released into the business.

Interviewer: So you talk about agility, that's …

Respondent: Agility. A big part. So governance perhaps the first part of it, agility being the second part and agility for us became the means to both speed, okay, speed, but secondly, quality. It's very strange that a lot of people forget about quality when they get into agility. They think agility is a fast way to bring things to the table and then quality goes out the back end, which is not the case with us. So yes, so input to the framework, governance, and it's governance that's across everything. It is secondly in that governance making sure that you've got your leadership profiles and your sponsorship profiles and your stakeholder management and all of those elements of a framework very nicely planned out because without those, you're obviously going to struggle to do it and we've learnt that the moment you start getting into agile there's a lot of frameworks you can take around business systems and management information that will provide you with an agile framework on how to do things. The how to do things. There's not enough frameworks that tell you why you're doing it. and we had to spend quite a bit of time on the why because the why is where the business measurement come in, in terms of: Why do you consolidate? Why do you something new? Or, why do you build something new? Why do you need an integration layer? Why do you need to understand on one page how to fill a business book? Okay, so that 'why' became a very big part of the discussion. We also found that in a lot of older discussions and frameworks not just a concentration on what, but also a concentration on who. So who's going to do the job? Still not really talking about why and how do you bring quality back into the discussion. So, quite an important part of …

Interviewer: Part of it. I want to ask you something here. Because normally in theory, you have three levels in an organisation: Strategic level, which you are in at the moment, Johan. Then you have the business unit level and you'll have the operational level, right?

Respondent: Yup.

Interviewer: So governance is normally instituted or initiated by leadership in terms of, as you said, stakeholder management, leadership and how it actually distils through to the business

unit level which would be management. Operationally you would find agility actually comes in there, because …

Respondent: So what we've done – sorry, that's a very good question. So, in this journey, we decided to take our whole business and to map it into end-to-end services. And end-to-end services both from a strategic, technical and operational layer. So when you look at your triangle, what we've actually created in your triangle, is to slice into your triangle, mapping an end-service around anything. So HR became an end-to-end service. Financial became an end-to-end service. And the terminology that we started to use is to say, okay, but we talk about the HR experience, and in the HR experience, there's five services and each of those services are mapped from a strategic process right through to operational process. So, and in that you automatically start to create an integration layer between strategy tactics and operations, but between the strategic part of the business, the business units and operations, because in the past a lot of people were thinking about operations in isolation to strategy and never could get the integration layer right because they start to think about operations need to be translated through some level of magic middleware to become something for a business unit and then there's some magic thing again that translates it to an overall picture. By mapping the organisation again to end-to-end services, we actually understand fully now how the experience is rolled out. So for example, sales is an experience for us. So, when you start looking at the sales experience, what's the services inside it? The services inside is anything from inside sales which is our direct to consumer and direct to partner sales, and that is a service arena for us. And you look at that end-to-end, what decisions do you need to make using that as an example to make sure that your call centres work correctly? That your call centre agents are correctly qualified to sell solutions over the phone?

Interviewer: Trained?

Respondent: Are they correctly trained? Have they got a 360º view of the customer?

Interviewer: What about work instructions? SOPs?

Respondent: All of it. All of it. So, right from that operational thing to the strategic decisions you need to make. So just using that slice as an example, over the last two years we've decided to pull these inside sales out of the locations they've been in and actually to centralise it per area. We've got free thirteen areas and we centralising per area. Why? Because we've decided the way we've done it previously from a strategic point of view, is we've done it for juniors in the organisation …

Interviewer: Juniors?

Respondent: Juniors. People that were call-centre agents, that were brought in. You know, that's the first job in the organisation and so we decided no, it all needs to be MBA students with five years of business experience in an industry that's highly paid. We also changed the model from using a lot of sweatshops to be honest with you, be it in Cape Town or be it in India. You know, to do these call-centre operations, we've changed it to a very sophisticated environment. The top environment in the organisation. Top remuneration. Very highly incentivised people. And the success ratio is 500% better than it was before. Now, that's saying that we've now end-to-end looked at inside sales. We strategically made a lot of decisions. We changed the business unit that we were running in total and operationally we had to bring the goodies together in a totally different way. And one of the things you'll find in Microsoft is that we're not – and this is the interesting thing – Microsoft is now totally platform agnostic. We don't care if we run on SAP or Oracle. We build things for Linux. We build things for Android. We build things for Apple. And, our whole philosophy is about cooperation with the rest of the industries. But in that, we've got an incredible passion of driving our philosophies of mobile first, cloud first and that whole world. So when you start thinking of our business systems, and everything that flow around it. Two years ago we were on-premise. Now we're 93% on the cloud, for a 90 billion dollar organisation. At the same time we have, like I say, dramatically rationalised, dramatically simplified a lot of things. We have now created layers of integration – technology integration – I'm going to talk a little bit about technology integration, where we had to understand what data lake we had to form to be able to bring all the data in a structured way together. And this is not at all the concept

of the old data warehouse or anything like that. This is about data that is both in form and in structure available to be manipulated so that you can take it upstream into the places that you want it. So we've created a data lake, and on top of the data lake, we've developed data manipulation tools and these data manipulation tools can take any element of data and bring it together in a very simple view for you. So think about the world. You've got SAP next to dynamic CRM next to an incredible big SharePoint installation with more than at last count 280 000 SharePoint sites and next to hundreds of different reporting environments with cubes Asana created in the past and you take that all and you put it into a data lake and now you've got a tool set that can fetch any of those. So now your design thinking is not design thinking anymore about where do I need to build an API or an interface to go and find the data? Now your design thinking is, the data is available. It's in the data lake. So I just need to fetch it. I need to know about the data and then I can fetch it. I can bring anything together. Then your thinking about business information, first of all, and secondly around business systems starts changing very, very fast because now your layers of, is it technically possible or not, is not there anymore. Now the layers are actually about, how do I make sure that I bring the right information to the right user at the right time? Now, if you say sales is an intense experience, and taking inside sales as an example again, how do I make sure that that new MBA qualified five-year experienced banker that I got in Dublin can phone the CEO of Absa bank in South Africa and have the correct discussion? So now I start looking at it from an experience point of view. What does this banker think about? What does Maria Ramos think about? So, Maria's thinking about her delinquency cycle, she's thinking about how she's doing in well, she's thinking about how she's expanding her bank, blah, blah, blah. Now you have to give that agent the right information. So the first level of information is a 360º view of what Microsoft have done in the past with Absa, but the second part of it is a 360º view of what Absa is doing. So how do you gain that? You start building a lot of things to create that business information. You start getting into social listening. You get into buying databases in terms of your information. You start taking all of those things. So, whatever you can find on Facebook, whatever you can find on Yahoo, whatever you can find on find on the media, whatever database you can go and you throw that also into your database and you use the same manipulation tools to go fetch it and to say, "When I bring you an agent, with a 360º view of this customer, I bring it to you with the latest about their financials, their latest about their needs, the latest about where they've built a building, the latest about what their results are.

Interviewer: Who their competitors are.

Respondent: And their competitors. Oh, and I bring you a holistic view. I also bring you a view of how we holistically deal. There's so many instances open. They're all about sequels. So there is a problem about sequels. So when you talk to her, she might, the CEO might have said to her, "There's a problem with these databases things you buy … you sell us." Okay, know about this. But also, there's been 500 of the business managers in Absa that has actually gone in and had a look at some of our new collaboration tools. Because, and it's definitely hot topic So, collaboration is hot-topic and so you start looking at every interaction that anybody from Absa has got with us. Then you take it one step further and you start looking at what does the customers of Absa say about … A part of this digital transformation story is – a bit of whiteboard here – but a part of this digital transformation story is for us to actually say, we look at it like this: In the past we've had – sorry, I didn't bring it …

Interviewer: No matter.

Respondent: In the past we've had products and services, okay. Then we started to look more and more about it as through a customer lens. So we started to bring customer stories into our recovery, okay. Then we started to say, but hang on, we've got to look at these as experiences. Experience of map through from a products and services to customers. Okay, so how does those experiences … How does a banking experience look? So how do we get it right? We've defined these four circles. And these four circles is all about how do the customer – so this is the customer …

Interviewer: Is this customer being Absa, for example?

Respondent: For example, Absa. How does the customer look at its customers? How does Absa look at Absa customers? How do Absa look at Absa employees? How do Absa look at productivity? And how do Absa look at cloud mobility for its customers? So now we start playing this thing. So Microsoft now are saying, our business systems and our environments can be geared so that we can help Absa to think about its customers, its employees, its product sets and its productivity and its cloud and mobility motions. And in that, we created an environment of trust discussion and this trust discussion is first of all about the fact that here in this experience layer, we are Microsoft's first and best. So we can go and talk about our experience around business systems and business information to the customer and what difference it will make on its customers.

Interviewer: So now it's stakeholders.

Respondent: Correct. So the ultimate stakeholder became the customer's customer. And through that you start to think about what you need to do internally different. So for example, we've had in the past, if you look at it on a timeline, we've had this inspection culture, but our business systems and our management information were an environment around inspection and we had to change that in total to coaching and coaching the industry and how that coaching actually influences your business systems and management information. So in reality, the discussion internally is a discussion around experiences and how we build things from a coaching perspective internally. The discussion externally is a discussion about how we can apply our thinking and our solutions to your customers. Anyhow, so that's just a little bit of a drawing around how we think. But the reason why that's so important, is that if your philosophy is to build business systems and management information and the integration layer because you want to inspect, so you want to know how A would correlate to B and why C is there and why D is not doing good. If that's the reason you do it, I think your maturity as an organisation is one that's still very low and therefore I admit that we came out of a low in Microsoft. We're definitely not there yet in terms of the maturity of being able to have a full coaching organisation right through the organisation, but we're doing very well to get there. So you sit now in governance councils around business systems and somebody will say, "We want to measure the world not anymore according to sales. We want to measure the world according to solution success. So how does that solution success translate in terms of all your different experiences in the organisation and all the services that run within those experiences, and what do you need to do then in your business system layers and your BI layer to be able to satisfy that? And then you get into, you cannot do more or you need to simplify something. If you want to do this, you need to simplify. That whole set of thinking around simplicity becomes …

Interviewer: Rationalisation.

Respondent: Absolutely.

Interviewer: That is very, very interesting. You know, you actually moved away from becoming the police to actually a psychologist.

Respondent: Correct. So it was from a product discussion to a trust discussion. So, just an interesting thing that happened at Microsoft, because of the way we ran the organisation. Because of the way our business systems were structured. Because of the way we've done inspection, we were not a trusted advisor anymore with our customers. Now changing the philosophy in terms of how we look at business systems and management information, greatly assisted us to start thinking about how do we want to regain the trust discussion. It was almost in Microsoft like the CIO was sitting in the corner building inspection systems as the business wanted. Now the CIO is sitting at the boardroom table, assisting the CEO on how coaching will take place to the customer's customers, which is a total, total, total different strategy.

Interviewer: Ja, you've actually gone away from a checks and balances to, as I say, a …

Respondent: Now I've rambled along on this side. Go back to your questions.

Interviewer: So how would you define a system? Normally they discuss a system as, your body's a system; it has a digestive system …

Respondent: Okay, I think this relates directly to the experience discussion. So, the way we describe a business system is to be able to end-to-end look at the experience and in the experience, the different services that run. I think that for us is how we got to the definition. Now you need to understand that within that saying, sales experience. Inside sales, as a service has got owners for the service. So now you start looking at your business not anymore in business units, you start looking at your business all up for a service owner and for an experienced owner. So there's now an experienced owner for things like customer care. So what does that mean? How does that relate to an experienced owner for sales? How does that relate to an experienced owner for HR? So now you've got an experienced counsel. What do they do on top of this governance counsel? They start saying, you know, I'll give you an example. Eight months ago, we departed on this journey to have a trust discussion and the senior people in the organisation started to have a trust discussion and then realized we could not scale. Because there's a lot of technical resources, there's a lot of productivity and mobility and cloud resources in Microsoft. But are there really people that are bankers? Are there really insurers? Are there really medical doctors? Are there really?

Interviewer: Professional people in other words.

Respondent: Ja, and we suddenly realised there's not. Eight years ago a decision was made to take the industry knowledge out of Microsoft because we became a product list. So last year in October we made a decision that we were going to employ 8400 people within six months. Industry specialists. So that was because of the fact that we cannot have the right discussion around trust with the customer once we started to understand that you cannot stop talking to a banker about his delinquency ratios if you're a technical person. It's not working. What are people now that were brought into the organisation that are industry specialists and they want to have a different discussion, what do they need to have a different discussion. So it's the same example as the inside sales example. To really take you back to a holistic end-to-end process around that.

Interviewer: How would you define an integrated system, a management … integrated system, standardised system? Let's do an integrated system first.

Respondent: So, integration for me doesn't mean anymore that it's one thing. So you could have information flowing into your data lake from a SAP HR model from a SAP finance model, from SharePoint, from Yammer or from CRM systems and so on. Your process of an integrated system is not anymore trying to build APIs and interfaces between different systems. Your process is all about how do you bring the right data - and in our case - all data together, and on top of that how do you find the right data and bring it to the right user at the right time or story?

Interviewer: So the end-user?

Respondent: End-user. And it influences your whole value proposition because it influences also what you take to your customers. So we do inside sales, which is ourselves selling, but then we do sell through, which is through a massive partner network. So what of this information is relative to your partner network? What of this information is relevant to your customer? Because your customer will want to see, okay, how am I doing? What's my problems? Where do I go to?

Interviewer: So in one line, how would you say, what would your definition be of integration?

Respondent: That you can get the right data to the right people.

Interviewer: Right data to right people. So all the data, and you implement?

Respondent: Yes. So the reason we took all the data in is pretty much because of the fact that we've set a data lake. It's where everything rests so that we actually can take it further. Now, it is to a degree a cloud philosophy in the sense that the cloud gives you the ability to scale the whole time. You can scale overnight.

Interviewer: Scale?

Respondent: Scale, like in have more of it. I was reading over the weekend that this massive accelerator in Europe has run out of space to save their data because the design said they will only be active 40% of the time, now they're active 70% of the time and don't

have space anymore. And they described it in Time Magazine as a problem. And I said to myself, “it’s not a problem. The technology’s not the problem. It’s how you think that’s the problem.” You know, you need to say to yourself, “It’s easy to expand. It’s easy to expand. I can do more experiments everyday, but just, how do I think about it.”

Interviewer: That’s true. It’s a way of thinking. It’s a design thinking. In terms of, we discussed an integrated system. A standardised system?

Respondent: Standardise for us is a swear word.

Interviewer: Is it?

Respondent: Ja. So there’s two elements to that. First of all, everything that we take commercially out to our customer base, we use the same version of that inside Microsoft. So you might say, Microsoft Dynamics that we take to the customer, that exact same version we use inside Microsoft. What does that mean? It means we’re not going into any coding or customisation levels off the systems anymore. It’s actually built into the core of the system and it works. Now obviously there’s customisation like dates and language and those kind of things, but that’s more user interface customisation. When I talk about the core of the system, you’re not for different markets or different customers start building in different fields. So the first element of a standardised system for us is that we use the systems vanilla as the engineering group …

Interviewer: Inside?

Respondent: Inside the organisation. I think the second part of it links to the world of business information or management information, or whatever wide definition you want to give to BI. The ability for the end-user to create the view for him- or herself, needs to always be there. We are 100% for it. But we want to make sure that that ability always spool from the same one source of truth. So, standardise for us means, not that you’ve got the same report on your desktop, it actually means that you pull from the same data source.

Interviewer: The same data lake.

Respondent: The same data lake, ja. Okay, and remember that the data around that data lake is that we’re not going to have two Johans there, we’re going to have one Johan there and we’re going to make sure that the one Johan is the correct Johan.

Interviewer: So integrity?

Respondent: Integrity.

Interviewer: How do you ensure integrity?

Respondent: Through first of all, a lot of new technologies. So things like machine learning. Machine learning has helped a great lot with integrity in the sense that being able to find the newest and latest and be able to tell you what is not there versus what needs to be there. We for example are using machine learning to update the stakeholders in our customers the whole time. Basically saying, “Okay, Person A has left. Person B is in place. Here’s how we prove it and the algorithms say to us it’s the right name, pull it forward”. This kind of thing. But I think integrity also still in a sales type of organisation depends heavily on how you input correct detail. So that didn’t go away. You can talk about machine learning, you can talk about IOT, you can talk about Artificial Intelligence, you can talk about all those things and still the human interface of not putting in the right data is the one where you fail if you don’t get it right. I think the other thing around standardising, then for us, is also the fact that we found in the audit that we’ve done, just when I started two years ago, we found over 40 000 different measurement points for an area, and we found, literally, tens of thousands of different reports. Now you can think. Out of these 57 areas, people through different lenses described different views of the same thing. And one of the processes of standardisation we had to go through, were pretty much to say, “Guys, if there’s a standard to pull from the data lake, say here’s a piece of information here to tell you what’s your revenue. You need to accept that’s your revenue. You need to make piece with that.” So in the governance council there’s been in the beginning a lot of fights about what’s the definition, what’s the process. So, getting the same lingo going. That lingo thing is …

Interviewer: Talking the same language.

Respondent: Absolutely. Talking the same language. I'm disrupting your interview.

Interviewer: No, it's fine. In terms of combined systems, do you use combined systems or not? Because we talk about integrated and said standardise. Do you combine any of these systems in your organisation?

Respondent: So we tend not to do it. Again going back to the fact that we use the data lake technology, we've tried to do it in the past and there was this massive figure of writing a Microsoft based front-end for a SAP system, and combining SAP and a Microsoft interface and a Salesforce interface on the Front Desk and all kinds of things like that and we just don't do that anymore.

Interviewer: I think we've discussed. Once you have a new system coming into your organisation, what is the next process? Because normally it's taken at a strategic level, at a CIO level, and then what happens with the new system?

Respondent: So, it's a very interesting process. So we went into experience thinking the whole way. So any new systems start with the user in mind, but we define who's going to be the stakeholders of the new system. Then we profile the stakeholders in a very big way. We go and look at a day in a life, a month in a life, a week in a life. Different different for the stakeholder. So we say, Jane is a salesperson in corporate accounts and she's a stakeholder. What does she need to do on a day-to-day basis in a selling environment? Because this is a new sales system. What does she need to do? Then we create what we call a golden moments. Those moments are really going to make a difference for the stakeholders, and we combine it in a golden moment map for the specific system. So you've got different profiles, you've got different golden moments, and then we actually go into, very fast, into mock-ups. Out of the data lake. We start pulling BI which is our data enablement technology. We start pulling mock-ups together in terms of, how does this satisfy the profiles? So the moment we start understand how it satisfies the profiles, then we can, at that moment in time we only start the agile design and implementation programme. And we pretty much go into two-week sprints. All our engineering teams work in two-week sprints now, from the design – because you've got a mock-up. Because you've got a profile and because of the fact, remember the governance is the whole time there and in the governance, just breaking that down, we've got what we called field guidance councils, we've got customer guidance councils, we've got experienced councils. All of those guys give input to make sure that these profiles and the golden thread is built 100% correct.

Interviewer: Is that a quality mechanism?

Respondent: It's more than a quality mechanism. It's because of the size of the organisation. If you sit in Redmond versus sitting in Paris versus sitting in Jo'burg versus sitting in Nairobi, you've got different views of life and you need to, at the end of the day ensure that you satisfy the stakeholders, and it could be one type of stakeholder. It could be Jane, the salesperson from corporate accounts. But the way she operates in Nairobi versus Johannesburg is different, and that's why you want to bring those people into it.

Interviewer: Describe the policy of integration in your company.

Respondent: So integration is definitely not anymore a process of integrating one-on-one systems. It's a process of integrating via the modern world of a data lake with] manipulation processes. We also use, because of the fact that we're Microsoft, we are very advanced in our collaboration tools. We sometimes use collaboration tools, like the new Microsoft Teams to be able to do integration. Now, let me try and explain that. So, Microsoft Teams, for example, bring together the work you're doing and the work I'm doing and everybody else collaborating in a single, very simple interface and you can work together with everybody. Why is that integration? It's the fact that you don't need to build anything anymore between Excel, SharePoint, PowerPoint, SAP, Dynamics, it is just, the work that you've been doing and the fact that you have social collaboration now, brought it together. So that is one side of the equation. Other side of the equation that we use Power PI very effectively to go fetch data out of whatever part of the data lake and bring it to the user. And because once again of the fact that the ability of

something like Power PI to be able to work across platforms, is there now. It actually made life quite a bit easier.

Interviewer: So, you have a structured policy to say at strategic level that this is how data flow should work in the organisation. Is it a framework or is it a policy?

Respondent: No, there's very big frameworks and policies into that. So, and perhaps let's change that into two discussions. The one thing governing that framework is security. So, we've got an incredible lot of work around what is security. How do we run a secure enterprise? How do we run an enterprise that is 100% compliant to millions of regulations from around the world? How do we make sure that the impact of that on our business systems is not fragmentation but still integration? Okay, and how do we make sure that what we do in Russia, you know, we can actually import / export to our other places and that's been quite a journey. So the whole security discussion, information security, compliance, cyber security, all of those things also basically to a degree, forced us into some design thinking how do we look at data, because data is at the end of the day the thing, and how do we protect and how do we make sure we do the right things when it comes to these layers? There are times in the organisation when we have people that's upset about the fact that in an integrated world like that, they don't have access to X, Y, Z and the reason for that is privacy, security, compliance. So back to your question about what is our integration policies: it is, integration policies start with security policies. There's a lot of things around privacy. For example, why can I not see the quota data of a team in France. I'm a senior leader, why can I not see that? And in France you've got worker councils and therefore you're not allowed to …

Interviewer: and trade unions.

Respondent: and trade unions. You're not allowed to see any of those. So bringing all those things into the design thinking also around that is very important. But in the end, integration for us is not a one horse town anymore. It is definitely a town that's data driven, so a fully data lake environment, but it's also experience driven. So you integrate your thinking for your mapping of experience to be …

Interviewer: Is this design thinking?

Respondent: Yes. It is our version of design thinking, ja.

Interviewer: What would you say are the challenges facing integration of management systems in your organisation?

Respondent: I think the past. I think the past, first of all, the fact that …

Interviewer: So traditional thinking?

Respondent: Traditional thinking.

Interviewer: So can you elaborate on that?

Respondent: So the fact that in the past people were sitting in the inspection culture, that they were running in silos, that they were thinking about integration being two things, being, an integration layer of your design or a direct API between different systems, you know, those things are definitely not a part of our thinking spectrum anymore, but you still step across it. So you'll get into a support area in Dublin, and you'll find that they still do things in a different way because you didn't discover them before, and it's just the size of the organisation that counts against it.

Interviewer: So traditional thinking, what else would you say?

Respondent: I think the other thing is complexity. So because of the fact that you run this massive organisation. It is never simple. It is never simple. So you start talking about things like volume licensing that's got an impact across all of these experiences, and how do you need to shape volume licensing from business system and a management information point of view to be able to fit into the right experience? I'll give you an example. That agent we were talking about inside sales, need to be able in an easy way reflect to the customer at Absa what's the license situation of the customer and be able to upsell or chain sell in that environment with the right knowledge. And that means in his volume licensing process, things need to be simplified. So now you start looking at volume

licensing as a service within your sales organisation and you start saying to yourself, "Okay, how do we do that?" So complexity still is a very, very big one for everybody. I think the other one that's standing in our way is just plain and simple egos. We're dealing with 104 countries where people are used to being autonomous and doing their own thing and when you're with Microsoft, creating a new SharePoint site or creating a new Excel spreadsheet or creating a new system is the easiest thing in the world to do, because we give people the right to do that. But being able to work with people so that they start understanding, you cannot go and just disintegrate or fragment everything, you need to bring together. So egos. And in that we've done a lot of hard work around what is people's change management. How do you change people from point A to point B? Because you can talk about business systems without people and you won't have anything. If you start talking about business systems with people in it, you first of all need to have the governance framework and all the different things around it. But you secondly also need to understand how do you change people. We've done a lot of hard work with Prosa, which is a Canadian firm. We didn't go any of the other methodologies. We decided on Prosa because of the fact that they focus on people change management. How do you change people from its current behaviour to a new behaviour and successfully do it?

Interviewer: When you say new behaviour, are you talking a high performance culture, or?

Respondent: Ja … there's a number of things. It's on the one side about changing people from a fixed mindset to a growth mindset. So, in that high performance culture. But it's also changing people in terms of their behaviour from a product house to a cloud service house, and more than that. From a cloud service house to a cloud solution house and making sure that everybody in the organisation understands that they contribute to this trust discussion that I was talking about earlier. And in the past, I'm not supposed to say this, so don't write this down, but we were a kind of, and you're recording, so I must, anyway, not say it, so scrap this. It's off the record. I think Microsoft to a degree were a fat cow organisation. It was easy to sell Microsoft products because productivity suites you must buy. You must have Word and Excel and all those kinds of thing. Now you're starting to get into a scenario where you need to have a trust discussion, you need to understand the industry and you need to solution because you want to make a difference in the life of the customers, of your customers. Different discussion. Different discussion. So, very, very interesting how we're going through that people change and that behavioural change.

Interviewer: Johan, you mentioned some key points here. You said that traditional thinking, complexity, egos, change management, growth performance, you want a high performance organisation, behaviour. How do you determine the maturity of integration in your organisation?

Respondent: How do you determine the maturity of it?

Interviewer: Normally you can say, level 1 being very high, or that you've got all your policies, it's been integrated throughout the organisation. Do you do any types of to make sure that.

Respondent: Oh yes. There's massive, massive audits, from a variety of angles. So I would say there's a number of mechanisms. We've got scorecards around, first of all some of the technical elements. How far are we into cloud? Because cloud technology brings a certain level of flexibility and integration to the table. Then you've got usage patterns in terms of, how do you use certain of the modern business systems or not use it. Then we've got behaviour patterns. Do we see certain business metrics being higher than what they used to be. So we start measuring our maturity. Not just in the input. So, there's integration working, but the output.

Interviewer: So you're looking at the transformation model?

Respondent: Yes, and is the transformation actually happening? And that transformation's always got the business metrics too. Let's talk about a simple one. And we decided to transform the way we look at marketing and sales. Marketing and sales used to be separate functions in the business. Then we started to look at the integrated experience and sales experience. So how do you integrate marketing business systems with sales business systems and make it an integrated experience? And we actually had to go

and design the measurements and it boils down into a very simple thing. That our average day of a lead, needs to change from over a hundred days, a lead becoming an opportunity. And just on our definition, a lead becomes an opportunity when you really start using it in a sales process. A lead is just a lead. So, the average to over a hundred days, how to we get it down to three days? And those kind of metrices became our map of maturity for ourselves … So very much so that we discussed the experiences, from a measurement point of view - every single one of them to be able to say where we going.

Interviewer: So how would you say? Okay you have an experience …

Respondent: Ja, we actually measure the maturity of the transformation, linked to the experience definition by a number of business matrixes.

Interviewer: So the business matrix model gives you an indication of the level of maturity.

Respondent: But then we also go and Prosa do our audits. So, Prosa have got a business maturity model and they do audits for us. Obviously our different partners do audits for us and then we make use of a number of the big consulting firms and research firms also to help us in terms of understanding. So the strategic scorecard and to see our scorecard is still an incredible complex scorecard that's got different elements and measurements. We also make use very, very strongly of what we call the voice of the organisation - the user voice. So being Microsoft's first and and best customer, part of the success of business systems get measured by directly, what does the business say about it? We've got daily polls. We've got weekly polls. We've got independent surveys. We've got independent interviews the whole time with business leaders. We've got massive speed and agility polls that we look at how those people use systems, can they?

Interviewer: Is this internally?

Respondent: Internally. Internal. So we've got massive research happening internally all the time saying, "Are we making progress on this journey or not?"

Interviewer: Is it anonymous?

Respondent: Anonymous, and sometimes with the consent of the individual, you know, you use certain people in focus groups, going forward to directly work with in terms of that.

Interviewer: Fantastic.

Respondent: So the whole process of what we call customer sentiment and Microsoft being the biggest customer of Microsoft. So think about it. Microsoft IT is the first and best customer of Microsoft. Customer sentiment of Microsoft IT to Microsoft is the most important measurement. Very, very interesting dynamic that you get there.

Interviewer: Fantastic. I think the last question now, Johan. What are the factors in your view that I should address that I have not highlighted in the questions here, if any?

Respondent: So, if I need to go to a summary and then see what's the gaps and say, you know, if we start with the concept that says everybody … everything needs to be in balance, how you look at people and governance. How we look at systems and money. How we look at priorities and agility. All of these things need to be in balance at the end of the day for you to deliver the right things in the organisation. If I had to highlight the things for me that's incredibly important, is first of all, the culture of the governance and how you do governance and then you understand agility and what agility means. And then if you understand your own definition of what is integration for you. What is transformation for you? How do you operate within that? And then did you still do that within the concept of maximum flexibility but absolute simplicity? Now you know, it's almost like I want to design for the big and the small guy at the same time and that's where the challenge always comes in, and I would concentrate very hard in the framework. Not on the technology aspects of integration, but far more on the business aspects of integration and I think the way, the hard work we've done to manage to map these experiences and to look at it end-to-end is what every business actually needs to do and for me, every business has it's own version of a digital transformation that they need to go through. And the business needs to make peace with its own digital transformation. So what am I going to do with my customers? What am I going to do with my people? What

am I going to do with my products and services? Everybody has got to have a different journey, but if that journey is not a balance between technology, people, money, processes. If you don't get that balance right, you're dead. And I joined a Microsoft that was out of balance and I'm not for a moment saying that we've reached the ultimate balance, but we're on the way there. Definitely.

Interviewer: Well, you've got a clear mapping from end-to-end so it will help you as well.

Respondent: I think also as well, in a type of … One of the management gurus and a lot of people stopped talking about management systems from an old perspective from what is a manager and what is a business unit and what is an organisation? And you know, a lot of times, the thinking then results in a hierarchical design. It doesn't matter if you want it or not. And the thing that we got right with the data lake and how we broke it, is not to go through the process anymore, or the bottom layer needs to be in place for the second layer to work for the third layer to work. We can actually slice into the organisation and get the end one to work. And for me, that's an important piece of philosophy on the one side, but also practical execution on the other side. So I said a lot. You took a lot of notes. So what I want to say to you, if you want to come back to me on anything …

Interviewer: Really?

Respondent: Drop me an email. I'm good with emails. Over the holidays, this period now, I might be a little slow.

Interviewer: No, it's no problem, but let me just say, Johan, thank you so much. You know, I can't … I can just say thanks. The fact that you've given me so much information. I still need to digest this, but the fact that you've contributed in more areas than one, and for me it's outside. Some of this was outside the scope, but you've actually brought the relevance into the study. I really appreciate it. I appreciate the examples that you brought through to make it much more easier for me to conceptualise it. I really appreciate it. Thank you Johan.

Respondent: I can just say good luck with the hard work you need to do to consolidate all of this.

Interview **10**

Occupation **Chief Information Officer**

Sector **ICT**

Interviewer: Good afternoon Mehmood, thank you for firstly meeting with me and offering your time, I know it's very precious, and you've given me this opportunity to progress with my study. Firstly Mehmood, I think just to give us a background on yourself, SAP, how long you've been in the position, your current position, and some experience.

Respondent: I've been with SAP for twelve years now, many roles, I'm currently the COO of SAP Africa, so we cover everything from Cape Town to Casablanca, across the continent, and my role is basically to ensure that the operations of the business on the continent work efficiently, but we also look at things like mid-term strategies and making sure that we are best positioned for the market in Africa. I've worked for SAP in places like Dubai previously, started it up when we bought it back from the distributor in 2008, I spent about 5 years there, and before that I had some roles as consultant in SAP, and before that mostly management consulting in places like Anderson Consulting, at the time it was called PWC, so that's a brief history of myself.

Interviewer: How would you define a system? And normally when you talk about a system, take the body for example, a system would be how you might have a digestive system, you would have a neuro system. How would you define a system?

Respondent: So look if you look at it from a SAP perspective, we deal with software right, so that's our game, and from our perspective a system is a set of components, data and an interface, or set of interfaces, depending especially in 2016 that is designed for a particular outcome, in our instance normally a business outcome and a system is also a representation of a value chain represented through a set of software and hardware components.

Interviewer: So taking that into account, how would you define an integrated system?

Respondent: An integrated system is where those components essentially have a way of interacting with each other that is seamless, and in a lot of instances doesn't actually require human intervention. The more integrated a system is, the less human intervention you would actually need, there's many idealistic theories around the Enterprise of One. I don't know if you've heard about that. I hear that you could run an entire global corporation with one person. It's an ideal state and there's many reasons why it's not practical today, but technically and theoretically you can have an entire organisation as large as a GE or a Nestle or whatever that runs purely on robots, hardware, software and one guy who gets the money at the end of the day, because you'll have especially when it comes to things like machine learning [unclear 37:21]the kind of technologies you are seeing today. You can run an enterprise that is integrated on all levels historically integration was either around hardware integration so i.e. a hard disc, and a processor and a keyboard that work together, or software which would mean a data base, an application and a user interface that work together, but in today's terms it's a lot more, all-encompassing across all of those things because you have sensors on every single device we use every day.

Interviewer: Sensors

Respondent: Sensor on a car for example, sensor on a fridge, a sensor, I mean your phone has hundreds of sensors, so that's a simple example, but this coffee machine could have a sensor.

Interviewer: It's like an interlock

Respondent: Yeah basically, practical example right, a coffee machine has a sensor that looks at the level of the beans, as soon as it gets low it sends a message, so you go from hardware to software, that software then orders the beans from the supplier, that supplier has another software system, so when you integrate now you are integrating between the physical machine the software that runs it and the user interface in a broad community right, so integration is not just that kind of single layer integration anymore, it cuts across

all different elements of an IT environment, and you're also integrating communications right, because …

Interviewer: because you have the human interface and let's say software. How would you define a standardised system?

Respondent: The scary thing about that is that there is no standard way I believe in defining standardised, okay, because if you were to ask a vendor like SAP or Microsoft or Oracle, they'd say a standardised system is one that is completely Microsoft or Oracle or SAP. In my view a standardised system is one that has a common set of interfaces, and a common language, and also a common business framework that it operates within.

Interviewer: And a combined system?

Respondent: A combined system, I don't know what that means, it doesn't mean anything to me.

Interviewer: Okay, because you are probably using more integrated and standardised.

Respondent: Yes, I mean, look. What is your definition of a combined system?

Interviewer: A combined system would be in-between a integrated and a standardised system, because if you look at, I interviewed one of the government organisations, and they spoke about, if you look at the three levels of management you're talking about leadership, business field and operational level. This level here at the leadership level, you find that most of their systems are combined, so what they say here they have two, let's say three entities, this entity is running, for example, SAP, this entity is running Oracle, and this here is where the decision-making body is.

Respondent: So I have a different term for that.

Interviewer: And they are saying, okay, that's fine, what they are saying is that because they are trying to make a decision here, they have to combine these two to make an informed decision.

Respondent: My view on that, it's a mess. It's called a mess, alright and I don't care, choose Oracle, choose SAP, choose something, right, but if you don't have a single way of managing your business that is completely integrated and I mean looking at from balance sheet through to sales through to individual rep or technician or whatever the case might be, you cannot make decisions.

Interviewer: You cannot make informed decisions?

Respondent: You can make decisions but they won't have the data to back them up right, and I think in today's world we have to understand the consumerisation of systems.

Interviewer: Consumerisation?

Respondent: So, let me explain. In the old days, if you were to ask a company that is using SAP, there's a bunch of people sitting in a back office, creditors clerks who had to go through three months of training to understand how to use the system. What happened then was, this little thing, a phone, and what the phone did, and the smartphone specifically, is that it allowed a more natural interface, a more … You download an app today on the android store, the Apple store or whatever, you can use it in one second. So the consumerisation of that means we now have systems in this world, people expect, consumers, me and you in their daily lives, we expect things to just work, we don't want to go through training, if somebody says here's an IT solution, it must just work out the box right, so if you need to do interesting integration or combination of systems it's not intuitive to the everyday person, and that adds a lot of cost and also slows you down dramatically.

Interviewer: Would you say complexity as well?

Respondent: Absolutely, I mean it does add a lot of complexity, so if you have a system that is intuitive to use, that allows you to see all your data in real time, in a simple interface, not simplistic which is a different issue, but a simple interface, you could have a board meeting every day, or you could decide not to have any board meetings.

Interviewer: So, user friendly?

Respondent: It's more than just user friendly. I think people talk about user friendly from an old PC perspective. The point is that you should be able to make a decision, whether you are sitting on a plane or whether you're at the beach, or whether you are playing with your kids, right. I mean, I can manage my entire organisation from this phone, it's a stupid practical example, but it's just something that organisations need to figure out, and simple is not easy by the way, simple is actually the most difficult thing to do.

Interviewer: Explain.

Respondent: Let's take the concept of what we call the digital boardroom, no paper, you can see everything real time. To make that work, it's a very simple lovely interface, three TV screens, you can see everything. To make that work across an enterprise in that pyramid that you draw, every single system needs to be integrated, every single system needs to have a standardised way of operating, the data needs to be available at all times, so that complexity is very difficult, a journey to go. Now it's easier for start-ups, because you're a company that has no baggage, but if you are a Sasol, with historically 23 operating divisions and a value chain, I don't know if you've seen that picture with the coal and the everything that comes out of the coal, they have one of the longest value chains of any company across the world, now to try and create that thing is difficult

Interviewer: Discuss the types of management systems in your organisation, the type of management systems you have. If you can give me an example, it will really help as well.

Respondent: Obviously we use SAP systems right, but I think one way to describe it will be real time and integrated, so we've moved away from a management system that is based on cadence, in other words time, so you would have a forecast call every week, you would have a review manager/employee half the year, you would have a month-end closing every month. You know there's a cadence to which a business works.

Interviewer: Milestones?

Respondent: Right. We don't work like that anymore. So because of the technology that we have available to us we don't do performance reviews, we have continuous feedback with our employees, and everything is recorded on our HR performance.

Interviewer: So how do you measure that?

Respondent: How do I measure what? The performance rules? Oh no, it's still measured. What I'm saying is it's not based on the cadence. I can have that at any time because it's all integrated, it doesn't matter when you do it, as long as you do it before the end of the year right, but it's also a continuous process because you don't have to come and say [unclear 28:14], so how did you do this here? I have a view; you have a view, we're thinking about things that happened eleven months ago right. This is a continuous process, instead of having a forecast every week or every month around your revenues or whatever the case might be, it's now happening all the time, and it's all available right, so what that does mean is that management is a bit more informal, yes it's formal when it comes to regulatory requirements. You would have to if you see a fault, you see a fault. You can't get innovative in finance, right. That results in Enron. But in terms of making business decisions and tactical decisions, you don't need to get a quorum of people around a table; you can do it in any time, right? And the other thing that allows you to do that in a world where everything is available all the time is a DOA, we have a clear delegation of authority, as long as you have a delegation of authority in place, use the technology to make decisions within your delegation and that's it. If we need to get approval, let's say I want to hire a new person and I need to get his position approved, first I need to get the head count, then I have to get the salary approved, I have to go through the interview process, choose the right candidate, get the salary approved, all of that stuff is automated now. So I can have an interview with you, I can put in my feedback on my phone right now, it goes up the line, it comes back and says, "Okay, that's the person you selected, how much do you want to pay him?" That's all in a little drop down box, I click on that, it goes up, it's approved, right here's the generated contract, and that's the way you work.

Interviewer: And that's efficiency.

Respondent: Yeah.

Interviewer: Is it an HCM [?] system?

Respondent: Yeah, but that's just the HCM. It's the same thing with regards to setting targets, finance or operations in terms of logistics or whatever. You use a similar approach otherwise you would have to wait for a meeting with the HR director, explain, feedback and all that kind of stuff, it wastes time.

Interviewer: It is also as you say a delegation of authority.

Respondent: Very important right, so that's built into the system, it's part of that system, it's part of the framework and it's based on roles. So as long as you have a clear definition of what the role is, they can fire me tomorrow, put another COO in, he has exactly the same delegation of authority that I have , and that makes it quite easy to work. The one challenge to that, in this world we live in is you're kind of on 24hrs a day, because you could be sitting at 8 o-clock at night and I could get a workflow that says one of your reports has decided to hire this person, do you approve the salary? click yes. So it's available and people expect you to respond and make decisions 24 hours a day. That's the one negative, but I think at least from an organisational perspective, I think in one way it can create more work life balance you can do your job at least for a certain part of the time at the beach, not all of the time, but some of the time.

Interviewer: Describe how you work or handle multiple systems in an organisation.

Respondent: Well, you try and limit it, right. That's the first thing, you always try and limit it. I think there's been this love affair that companies have had with multiple systems over the years and the only that has resulted in, is cost, complexity and potential breakdown in processes okay. If you're buying a car, you're not going to buy the chassis from BMW and then go to Mercedes for the engine, because then you are responsible for the upkeep, maintenance of that vehicle, you're dead in the water, and I think that's where we went wrong from an IT perspective. But nonetheless, I think the industry from a systems perspective is kind of had a way around this and that is basically, even if you have different systems, have the same platform. So one of the things you find a lot of vendors doing right now is the ability to build on their platform. So I'll give you an example for SAP: we have a store where you can buy systems that our partners have built by using the SAP platform, so you can still get that great IP as long as the platform is working, they kind of work together, whereas before everything was proprietary.

Interviewer: Yes, IP.

Respondent: No, systems were proprietary, if you had to buy SAP you'd have to, you know, you can't get into the mechanics of it. You'd have to make sure there's some middleware that makes the other system talk to it, you don't need to do that.

Interviewer: So you say this essentially limits systems, because it's costly, it's a breakdown in terms of a … complexity. So how do you handle that?

Respondent: Well from a SAP perspective its easy right, we just use what we build.

Interviewer: In-house.

Respondent: We use the stuff that we sell to our customers, that's the bottom line.

Interviewer: So whatever you use in-house, you also sell to your customers, so it makes sense. So must believe in your product

Respondent: Absolutely, absolutely. It's not to say you won't use Microsoft products for certain things or Apple products for other things but where you do have your portfolio. For example, Microsoft is one of our largest customers in the world, and we are one of their largest customers, and I think we are the largest users of iPads in the World SAP, and Apple iTunes runs on SAP. So it's a bit of an incestuous relationship, but I think the guys have figured out where everybody is good at and stick to your own expertise.

Interviewer: In your view, can you describe at leadership level are management systems integrated, or standardised?

Respondent: Both definitely. So it's improved significantly over the last few years. I think historically, if I needed a report, I'd have to go to somebody because they wouldn't be integrated as standardised systems, and as technology has improved. As we've managed to integrate technology into multiple types of devices and have cloud solutions sitting anywhere, again that consumerisation I talked about, I can do it myself, so it's available all the time.

Interviewer: To what extent would you say that your management systems are integrated in the

Organisation? If you had to look at the level of majority, but with there's obviously with majority comes a few quality assurance things that need to be put into place.

Respondent: Sure. I think we are highly integrated.

Interviewer: So we say level 1 being very high and level 3 may being just at operations.

Respondent: No, no very high.

Interviewer: So level 1.

Respondent: Level 1. Yes.

Interviewer: And how do you ensure that you are at level 1?

Respondent: Again I think that standardisation is very important, as well as ensuring that - I want to be slightly controversial now - something that a lot of companies are learning is; they need to live with the power of IT, the minute your IT organisation starts making decisions, they make decisions for technology sake, not business sake, take that out the way, they don't make decisions, the person who makes decision on the finance system is the CFO, the person who makes decisions on the operations system is the

COO, and together as a group with the CEO and the HRD and all these people, they will make decisions. Imagine if you have IT making decisions, it'll be like, that technology is cool, let's try that out, or now we need to make it work with the [unclear 20:08]. That's okay, we have five developers there and then they'll do it right. I mean it's a problem because their jobs are to proliferate systems, not simplify, so you task your IT department to simplify, and you force them to do it by saying you're not going to have 500 people. A classic example of this is the banks, banks have larger IT departments than some software companies right, and that has resulted in complete paralysis.

Interviewer: Paralysis?

Respondent: Of their ability to do business and be innovative, they can't be agile anymore because they have so many different systems, thousands of developers, and what you're seeing in the industry, the financial services industry now, is a complete shift; they're saying we don't need these big IT shops, we are going to go to the people who actually build software, we're just going to get it from them and use it because this is actually killing our business we're not a software development house, we are a bank.

Interviewer: Financial institution.

Respondent: Exactly, and financial institutions are one of the industries where the spend on IT is the highest because a bank is essentially you know, banks don't have vaults anymore they have servers. That's where the money sits, it doesn't sit in a room of cash, it's in the computer, and what we are seeing in the industry, a lot of them are saying uh-uh we don't need three thousand developers, we need 20 people who make the decisions and partnerships with the right organisations, that's it.

Interviewer: What would the role of senior or top management regarding the management of these systems? What would your role be in terms of managing these sort of systems?

Respondent: Managing them?

Interviewer: Ja, I think it's the ideal question for you being the COO.

Respondent: Ja, being very clear on what the processes are of the company, of the organisation;

ensuring that there is a common set of requirements across all levels of the organisation; and a third one is daily engagement in anything to do with systems. What I mean by that is, if you look at where companies are successful and unsuccessful in

implementing new systems, those that are successful invariably have top management involvement, because in today's world, the system is the business, again when you leave it to the IT organisation and a project manager to do, that system implementation is always a failure, goes over budget, you don't get what you want and it takes far longer than possible. I've seen it in big organisations in South Africa where the top management is literally their KPI's, their bonus is based on the success of that system implementation, works a charm because they can number one move the organisation to make it happen, they can set a vision that actually works and they can always bring the organisation back on track and say this is what we were actually trying to do, let's not deviate from it.

Interviewer: Quality, cost and time. You mentioned three important points here: process, clarity on processes, common set of requirements and daily engagement. I just want to say, on the second one: common set of requirements - communicating the set of requirements, or common?

Respondent: Common set of requirements.

Interviewer: Here this is more standardised.

Respondent: What I mean by that is, let's look at the analytical side of systems right. At the end of the day most systems in the world would give you data or analytics out of it right. And you find when you go through a system implementation that different people within the organisation have their own personal needs, they are also resistant to change, okay, so, many times a system implementation is just a new replication of what business was there before, not actually making the business better, so it's about driving that common set of processes to say guys we don't need three levels of leave approval. I don't care what you do in your department, but we are going for one level of leave approval, as a stupid example right, but driving that common set of requirements is not easy, especially in a larger organisation. There's many different silo'd thinking people who work separately and there's a lot of this, not built here mentality - I'm very different. Well you're not different, a balance sheet is a balance sheet is a balance sheet, and if you try and be different there's something wrong, yes when you try to be innovative like SAP. We develop software, that's where we will be different, but in terms of HR and finance and procurement we don't need to be different, we need to be efficient, and that's the challenge, focus on what's core to your innovation, and the rest of it, guys we need to be standardised, we need to be simple and we need to have a common set.

Interviewer: How do you ensure daily engagement? You said, daily engagement of systems.

Respondent: If there's a system been implemented, then you will be part of that implementation. do not delegate right, if the system is in place then it's just about ensuring that it's maintained regularly and that there's no changes, again that comes under that delegation of authority, and change control, because systems, over time get twisted like a pretzel it starts up very clean and neat, and after ten years you come back and it's organically grown into something different. so it's just about the governance really.

Interviewer: Good point. Do you have a framework which you use for integration of systems in your organisation?

Respondent: Difficult question to ask us because again we use our own systems.

Interviewer: But do you have a framework?

Respondent: look, for us it's really around the business processes because we don't use many different systems, we really use one system with a lot of different processes in it the framework is really based around, you know previously it was more around how the data is structured and how you access that data, it's very different today where in memory bases you can just dump the data any which way, it's about the process and how you interact with the data.

Interviewer: So do you have a policy?

Respondent: Absolutely.

Interviewer: So you have a policy.

Respondent: We have sets of policies around what systems you can and cannot use, we have policies around what systems you can deploy, we have policies around who can approve these kind of things, we have policies around budget setting, we have policies on …

Interviewer: On integration itself?

Respondent: Yes we do, our policy for integration is a very short document, it basically says as long as it is our own product you can use it.

Interviewer: OK, interesting. So what do you think are the benefits of integrating management systems?

Respondent: Like I said earlier, faster decision-making.

Interviewer: Quality, cost, time.

Respondent: Yea, but I think that's wonderful for a project. Okay, good, now the system is there, what's the benefit from a business perspective? Honestly the ability to stay in business, seriously if you do not have …

Interviewer: sustainability.

Respondent: Ja, you'll go out of business, it's as simple as that, I mean IT is not a back office thing anymore, systems are there to run your business, if you don't have a system that is actually integrated, you're dead in the water. Here's a practical example: There's a bank in this country, you can go open a cheque account, and they'll give you one then you go back the next month and ask for a home loan, they'll enter your details in again, they'll ask for your payslips again. Remember you are a customer, you have an account, you will apply, you get approval or rejected, then you'll go back in a years' time, you are still a customer, you'll ask for a home loan, you go through that entire process again, then they might reject you because they have no clue about the business that you've given them over the last two year [unclear 11:32]. This is serious, really, and most of the time customers will leave a bank three years after they joined, why? Because that experience is just not there, so you're losing a customer. You go to another bank and they will give you a full portfolio with a single view, which bank are you going to stay at? Which bank is going to be more profitable? Right, that's just from a bank perspective, just using as an example right. We have, let me give you an example of two cities in South Africa, one has an integrated system okay, they can tell you,

Interviewer: Two cities?

Respondent: Two cities in South Africa. One of those cities – metros - has an integrated system, they can tell you where your grandfather is buried, on the system, they can tell you all the properties you've owned, how much you paid and how much you still owe, and if you were to buy another property they can give you a consolidated bill and they can even do, what do you call it? Estimations on your bill over the next year, on the same platform you as a citizen can call their 911 service, emergency services, it's all on the same platform, that's one city right. Here's another city without an integrated system, the bills are not right, they can't tell you what properties you own, you can call a call centre but they will send you to five different centres for water and for electricity and for rates and for sewage. Which incumbent party are you likely to vote for in the next election? So like I said whether it's public or private sector this is about surviving, if you don't have an integrated system, you're going to go out of business.

Interviewer: You said something that was very clear, you spoke about agility as well.

Respondent: So, again let's go back to the bank example okay. You want to introduce an insurance Product, you don't have an integrated system, you don't know which customers to actually target, you don't know which products are more profitable, it takes you six months to bring that product to the market. Now the bank that has an integrated system can make those decisions in two weeks and have the product out. Who wins market share? Exactly. It's the same thing with retail if you look at a company that has an integrated system can take their bricks and mortar store onto the web in no time, because you've got all the information there, it's just move it to another channel, but if

you don't have that, you're going to have to build the stuff up from scratch, meanwhile online retailers are taking your margins away. I mean, I can use any industry.

Interviewer: So you're saying that integration actually assists with agility.

Respondent: Business agility.

Interviewer: Just the last question: What are the factors, in your view I should address that I have not covered in this study so far?

Respondent: Okay I think there's particularly two trends that are absolutely critical to business systems or systems in general, the first one is the internet of things, or IOT. So there's this … You know we have millions of PC's in the world, we have billions of phones, but we will have trillions of things. What they mean by that is everything's on computer, everything's part of the system today, whether it be the phone, my sprinkler system is linked up to the internet these days, your TV is actually a smart device, your car, when you go for a service they plug it into the computer, they know exactly when you were revving that engine too high, it's all connected. Your watch is a smart watch these days, your shoes that you run with tell you how much steps. These things are all integrated. So if you look at a company like Under Armour for example right, what they do is, they will send a message to your phone saying, "We noticed you have run 300 Km in the pair of shoes that you bought. By the way, the new version is out, and we think it's time for a change, and by the way the nearest store is 3 Km away, do you want to go?" Yes and you go, right, that's the kind of world we're getting into. So what I was saying earlier about systems not just being a computer with a set of data and systems it's actually very interconnected now. That's the one thing around IOT right. Or for example Caterpillar, you know exactly when you have to replace something on one of those Caterpillar devices because everything is connected, predictive maintenance is something quite amazing these days. The other thing is machine learning, machine learning and artificial intelligence is the next big thing, we already see significant investments by all the large software manufacturers around that, and that is around you know, the actual systems themselves starting to make the decisions, at least on a low level at this moment in time so not necessarily the big strategic decisions, but the system actually has the decision making ability in itself, and it learns from past experiences. So it would know that I'm not going to send a [unclear 05:39] letter to this customer because based on historical past experience the business the has been reluctant to do so because of whatever reason. A simple example of machine learning: So when I wake up in the morning my phone has learned that I use my music app, and this particular playlist, because I go to gym. When I switch it on a little thing will come up and say favourite playlist for gym click on it and it will start playing, because it's learned, that's a very simple example of machines learning algorithms, if you look at things like, have you seen this Amazon Alexa device?

Interviewer: No.

Respondent: It's a little speaker that you talk to, you can use it at home, like my kids will ask it questions all the time like Alexa what's the highest mountain in the world? And she'll give an answer, but what we've done is integrate it with business systems. Once you integrated with the SAP system, and you would have the algorithms in the SAP system it can learn, you can say Alexa what would happen if I were to decrease my workforce in Guatemala by 15%, and the system would go and figure it out and come back and tell you revenues would most probably reduce by this much, but you can save this much cost, my suggestion is you should maybe think about doing it, would you like me to do it? And then you do it. Another example of machine learning, self-driving cars. A self-driving car is a system, because it is a system not just for private users like me and you, it's a system for a company like Hoover, a company like Avis Fleet Management, a company like Transnet, or Eskom that transports coal, It's an entire system that learns how to operate, now there's a lot of talk about the robots finally being here and taking over the world, but the reality is just like how factories were roboticised over a number of years, the same thing is going to happen with tactical everyday business decisions. I mean I don't make a decision on what to listen to, my phone tells me what to listen to, which is, okay, I'm cool with that, it saves me, I can do other things, and it's the same with business, I don't want to know if I should hire five people or four people next year,

the system can figure that out. So there's a lot of literature around it right now, but in the next five to ten years I think it's going to be.

Interviewer: Artificial learning?

Respondent: Machine learning and artificial intelligence.

Interviewer: My last question:

Respondent: Yes.

Interviewer: You've mentioned that there's challenges with integration of management systems, something that you said that traditionally there were silos but we are breaking that down, the change management concept how do you actually inform people that you are going in a certain direction and showing them that milk and honey, because not everybody can conceptualise that.

Respondent: So it depends where you are on the generation. I think if you look at the millennials, that's the easy part they're used to change and digital generations will be even worse, so people born after 2000 there won't be a problem. I think you explain the value, but you also bring it clearly back to what the ultimate goal is of the company. Again, you leave it to IT, they're going to say here's a new system. No one's actually explaining to them that what we want to do, is, we want to have a much better transparency - I'll give you an example - of costs across countries and that's why we are changing our cost centre structures and that's why we're putting in place a new system that will be able to do that.

Interviewer: So you say transparency is also a challenge?

Respondent: No I'm saying to be successful, to drive the change, you have to be transparent and archaic leadership styles cannot provide transparency - old style leadership.

Interviewer: Traditional leadership.

Respondent: They want to keep the, "I make the decisions and I just tell people what to do".

Interviewer: Autocratic leadership.

Respondent: Let's say non-transparency.

Interviewer: Thank you so much Mehmood, I really appreciate your time, it has been really Informative. I've got a different perspective on integration now there's just one last thing that I need to ask you the study is both a qualitative and a quantitative, so the qualitative side means I have a face to face interview with you, so the next part of this, maybe next year February or March will be a questionnaire that will come through, but this questionnaire is not directly related to strategic leadership in terms of you, so there are people that are reporting to you, so would you be able to just do me a favour? Obviously its very generic questions, not organisation specific for you to disseminate it to your people.

Respondent: No problem, Absolutely.

Interviewer: Thank you so much and I really appreciate your time.

Respondent: Thank you for your time, appreciate it.

Interview **11**

Occupation **Managing Director**

Sector **ICT**

Interviewer: So, good afternoon. Thank you for the opportunity to interview you. Your time is very precious and I thank you for trying to move the agenda of doctoral studies in South Africa forward. We are actually in a room, I think because of the rain, we'll just have to speak a little louder, please. I will ask you a set of predetermined questions, but before we kick off the meeting, can you please give me a brief overview of your background and your current position?

Respondent: Okay, so, my background is, I am an engineer by profession. I started with Anglo projects. De Beers. Mainly on the mining, in the mining industry. I spent a lot of time in Botswana, where our primary focus was around building the new mines. I think in 2004/2005, I can't remember the timeline.

Interviewer: Sure, that's fine.

Respondent: Then we looked at acquiring software, which was one of the key companies that we considered, to replace our AS400 platform that we had running at De Beers. Then that happened. From there, I got a bit tired of travelling into Africa, because that's what mining was about. We were in Namibia or Botswana or South Africa, and I decided to try a new challenge. came along and I took a role in consulting. Worked as a consultant for a few years, from consulting I went to pre-sales. From pre-sales I went to sales. From sales, I moved on to head up public sector and from public sector, I'm now the MD since April 2016.

Interviewer: Fantastic. New venture with new challenges.

Respondent: Of course, always. And fortunately, having a better half in life, is where, you know with engineering we are very logical in every decision-making process that we have, so I have spent some time also studying psychology, so I developed that side of myself. This emotional intelligence that people talk about.

Interviewer: Emotional Intelligence. EQ.

Respondent: That is about it, I mean other than that, the job is managing Southern Africa business, which also includes Namibia and Botswana in the portfolio. It's a growing organisation, a good challenge.

Interviewer: Enjoying it?

Respondent: I am enjoying it.

Interviewer: Fantastic. Thank you so much for the background. Maybe just as we go into the questionnaire, please provide a brief outline of the management systems in your area, in your organisation.

Respondent: So, if look at management. If we just look at management, things that I need to manage, right, so I manage the top line and the bottom line of the business.

27:50

Interviewer: Top line and bottom line?

Respondent: From a revenue perspective. Right, so numbers.

Interviewer: Okay.

Respondent: I manage people. In terms of obviously, you know, their performance, etcetera, from my leadership team, and in order to manage the numbers ultimately, I've got to know what is in our pipeline, where are we from ideal process, etc, etc, etc. So, let's talk a little bit about it. Financials are financial systems right. I have a view of where I am from revenue generation, from an estimated-in, from a closed perspective, from a profit and loss perspective. And I have that, I can look at that at any time, that's an system that obviously we're using, that helps me manage that. From a day-to-day business perspective, in terms of things that enable that, it's our CRM system, which

is your customer relationship management system. That shows me the health of my business, obviously from a four-rolling-quarter perspective, so I need to know are we sustainable looking to the future? Are the revenues there? Is this a healthy business etc, etc. And that also obviously gives me the outlook for the current year, so looking at, this is what my budget is, based on what the system is telling me, this is where I track against the budget and I know what I need to do. So, those are typically, I mean those are available daily, they're updated actually every two hours, but I typically look at it on a weekly basis, with a deep dive that I take, maybe once a month. From a people management perspective, so in terms of development of individuals, in terms of leave management, in terms of, you know, performance calibrations etc, we have a system, an HR system called Success Factors, and I manage my people with that. So, obviously, even if you look at the organisation, I set my priorities for the year, and I cascade down to my lower level managers, my leadership team. They cascade it down to, if they have managers, to their managers and ultimately the team, which is, you know, the sales team, services team or whatever that team is. So, we also, you know, in terms of KPIs and measuring performance, that's. I mean, I, my leadership team can change, but I have my priorities that I give tothem. They may have individual priorities per industry they then cascade down. So, from a systems perspective you know, my primary management systems, if I look at management tools to manage this business, it is the HR system called Success Factors, CRM for longevity and the current health of my business.

Interviewer: Sustainability.

Respondent: Sustainability, that's what it measures. And then I have a financial system which will look at the actual numbers.

25:00

Interviewer: The financial system being?

Respondent: It's system. It's.

Interviewer: . So, you have three types of systems here, so you have. Just for clarity, do you have ?

Respondent: ERP, it's everything right, within ERP. It's finance, HR, etc, etc. So, CRM is part of that system.

Interviewer: Okay. And your finance is part of ?

Respondent: Finance is.

Interviewer: And HR?

Respondent: HR is a system but it's cloud-based, right. It's not, it doesn't sit on a server somewhere and it's integrated into.

Interviewer: Oh okay. So, what do you say, is it not aligned to ?

Respondent: It is a system ja. It's fully integrated.

Interviewer: Fully integrated. Oh okay.

Respondent: Remember, is beyond ERP, I mean innovation.

Interviewer: No, I fully agree. So, there's, in terms of a system, what do you understand about a system? What do you understand about a system?

Respondent: You know, a system can be anything right, it's, so, for me it is, it should be things working together to give me the information that I require. It doesn't necessarily, it could even be physical work-force right. It doesn't necessarily have to be an IT system. I mean I could have people running these on pieces of paper that I ultimately put a report together that links into, you know, my HR, because it needs to have the people information for CRM. You need to have the CRM information for the finance system. They need to be integrated for that to be a system.

Interviewer: Okay. So, then now I want to take you to the next question. What is an integrated system?

Respondent: An integrated system is where everything happens.

23:11

Interviewer: Where you get your CRM, your financial and your HR management?

Respondent: Linked.

Interviewer: Linked.

Respondent: Exactly. I mean, a simple example would be where, if I look at, so when my budgets are set right, budgets typically come from the top down to me.

Interviewer: Right.

Respondent: If they come down to me at a value that my CRM is not supporting, you know, then there's, that's non-integration. Another similar example is if my account manager, so the sales guy, has a closed date and in the leave, in the HR system he's on leave on that date, that's not an integrated system. It means the things, the pieces are not talking to each other.

22:20

Interviewer: So, you say here they must talk to one another.

Respondent: Ja. They must talk to one another and they must share information, but it's not, you shouldn't have information being pulled from one system, then another system and then you tie them together. I mean, you know, in Excel. Excel okay, ja, it can integrate but that's not an integrated system right.

Interviewer: It's a system on its own. What do you understand by a standardised system?

Respondent: So, standardised is, when I look at the word standardised right, I suppose you have, you can look at it so, for one standardised is, ja let's use finance. Let's practice standard financial practice right, so, then you have vendors like Oracle, that produce these standardised systems. You're not custom-writing a system right, and that, in terms of, then you stay in as much as you can, to standard. I mean an accounting principle is an accounting principle right, and it should be standard. You shouldn't be deviating. So that, and when a system is implemented, it should be implemented as close to standard as possible.

Interviewer: If I ask you what is a combined system, would I be pushing it?

Respondent: No. So, if you mean combined, by, let's think about this a little right. So, I suppose combined could be a combination of let's say, let's look at as an example right. So, we have, I have payroll right. Standardised is the standard payroll that comes from where the software is developed, which is Germany right. So, it has some international standards, some best practice etc, etc, etc. Then there's South African legislation that says that this is how we have to, these are the rules for paying tax etc, etc. And that little bit of customisation then gives me a bit of a combined system, that's sort of standard and localisation, if you want to call it that.

Interviewer: Yes. Okay, that's fine. How do you handle actually, multiple systems in your organisation? Or in your area?

Respondent: So, I suppose for that I have to go back to my previous area right. Because here we are standard and in we're not going to use systems that are non- right. So, I mean if you take standardisation to another level, you're standardising on a single vendor, or platform.

Interviewer: Platform.

Respondent: Here we standardising on a single platform. So, the question is, how do I cope with?

Interviewer: Multiple systems.

Respondent: Multiple systems. So, if you look at, I look at my time at Anglo which is where we had, we had the systems that actually ran the engineering stuff right, so those were what we call PLC's right. Capital level one information told us what was going on in the plant. We had the AS400 which was our ERP, which had our financials, our

budgeting, our planning etc, etc. And then we may have had some other arbitrary system that did whatever else. So, they key things we looked at, and I don't know how it was before my time. But we looked at an integration layer software. So, we took, I don't know, we call it middle-ware now, but that time we spoke integration. So, you know, we as have integration software AG is a middle-ware specialist and stuff. So, back then we used Microsoft for our thing. So, we use that and we basically integrated all of these systems.

Interviewer: Into Microsoft?

Respondent: No, no, we used Microsoft as the tool right, to do that, because you didn't have so many, you know, I mean I would say, you know like standard integration tools. So, and then you had to build an interface into the PLC network, because Microsoft didn't have that. But, basically, that was our integration layer. And mainly we, you know, systems talking to each other was a secondary requirement. It was more important to bring it into a place where we had the information sitting centrally, so then you could, you know, have a holistic view of what's going on within the operations. And then later, we got those systems to talk to each other.

18:02

Interviewer: So, essentially, you had your PLC, then you had your finance and then you also had a human part of it where you'd manage the, how can I say, the human part would be?

Respondent: So, I mean, human part would have been things like, so let's say down-time right. Or loss of productivity, ja.

Interviewer: Oh, ja okay. Your liability.

Respondent: Ja exactly. But I mean it was all of this talking together to then say you know, whether you're going to make targets and challenges that were required.

Interviewer: That were required. The output.

Respondent: Ja, output.

Interviewer: Okay. Once you have a new system in your organisation, it doesn't have to be really in, but from your experience, how do you handle the next processes? So, maybe at a strategic level, where you are sitting here at the moment, at leadership, you know that this triangle would have leadership, management and operations. So, at a leadership level, you have decided that you want to get a new system, what are the next steps that you would have to take?

Respondent: So, we decide that we want, then we basically, I mean, we have multiple executive committees and stuff like that, so you know, there will be selection criteria, or maybe a tender process. Short-listed vendors would come and present. We'll then go through, we will sit as the executive and basically, I mean, then the decisions get taken in terms of, this is what we're going to use.

16:23

Interviewer: So, what is the next level?

Respondent: Levels?

Interviewer: Ja, okay, what happens next? So, you've made an executive decision.

Respondent: So, I'll give you an example right. So, recently we have that Success Factors was a cloud-based solution right. One of the key requirements around that selection for us as an organisation, was the fact that it was like a Facebook/LinkedIn/Twitter-type interface, where it was, the biggest problem is, you get these tools and then it's the change management that comes with it right. So, this was a familiar interface to everyone, we never had training on that. None of the leaders, none of the managers, none of the staff had training. Everyone figured it out themselves, because of the way, the nature of how this interface was. But where, obviously I've been through change where we've selected the tool, and I've been through some disastrous ones,

where we didn't have, we never thought about change management. People just didn't want to move from what they're used to do.

Interviewer: Traditional.

Respondent: And then there was the one where obviously, you learn from your mistake then you got change agents in to ensure the proper training was happening.

15:14

Interviewer: Good.

Respondent: But, I mean, newer ones are where we're looking for this type of interface where it's self-learning.

Interviewer: Self-learning. Okay. Is it something new? Because normally, as you said, traditionally you would have change agents to show the employees that this is how it needs to be done, and the type of training that you'd have to go through.

Respondent: Yes. But I promise you, in this day and age, I will not select a tool that doesn't have that kind of interface.

Interviewer: Is it. And say what type of?

Respondent: You know, like this, what people are familiar with, like working on, I mean no-one taught you how to use Facebook, you figured it out yourself. Exactly, so.

Interviewer: How do you think that will be embraced in an organisation? Not only, because maybe if you're not a software developer, but in an organisation that is not software inclined?

Respondent: So, I find, so, if you look at, this is based on your sort of, I suppose, age-group of your employee base, so younger.

14:20

Interviewer: The millennials.

Respondent: The younger, the millennials, all of those guys, they just adopt the new standards and new software. The older generation, funnily enough, they're figuring it out themselves, I have to say. You know, and it's about also making tools, you know, when you want these kind of things, if you look at our sales guys right. There we have tools. They have to maintain those tools in order to get paid their commission. So, it's not like I have to do this for fun, because some manager needs to tick a KPI. So, you know, when you start linking it to performance, and especially monetary, people do what they need to do. HR system, your performance review is done in there, so you have to first carry out your self-assessment before it goes to your manager and stuff, so you're going to do it, because your increase is based on it.

Interviewer: So, it's part of a reward?

Respondent: Yes, linked to a reward right which is.

Interviewer: Sure. What is your view on integration and standardisation and combination?

Respondent: Where?

Interviewer: Of management systems.

Respondent: So, you see, when you talk to us as a, you know, multi-national single vendor, our systems are integrated. When I look at, I deal with many customers, and I look at many organisations out there and I am a firm believer of that, because when you go, and I've experienced this first-hand, you know, you select, you know you get some CIO or whatever. You know, I've got against, I'm talking, this is my personal experience right.

Interviewer: Sure, sure, it's your view.

Respondent: Is you know, where I want to go, so I select this for that, I select this and that, and that, and that and do all of this and you forget about the integration. And sometimes we go on price, because that is the cheapest now, to put that there, that's the cheapest way to do that there, and then the integration costs, actually costs you like

ten times more with what you've chosen, where if you decided, I'm going to standardise within one integrated platform already. So, more, I'm finding more and more, that organisations are looking to standardise across a suite of products and you know, systems that talk to each other.

Interviewer: Vertically or horizontally?

Respondent: Both.

Interviewer: And what is your view? Is it a good way to go in terms of trends and the world trends? Or you think it's?

Respondent: I talk about what works. And what I've seen is that it's a good way to go in terms of what I've seen.

Interviewer: So, one, integrate and then standardise? Or two, standardise.

Respondent: If you are a new organisation, standardise. If you are an existing organisation, then you integrate, then standardise.

Interviewer: Okay, fantastic. Do you have a policy on integration in your company?

Respondent: Not that I know if, I'd lie to you if I …

Interviewer: Okay.

Respondent: But I had a policy at De Beers on integration.

Interviewer: Integration. Is it?

Respondent: In terms of, you know, standards and what needed to be adhered to etc, etc.

11:14

Interviewer: No, that's fine. What would the role of senior or top management, regarding management of systems? What is the role of senior management, or leadership in the management of these systems? I think to some extent you have answered it, but, you said that you have those three different systems and you go through it weekly, and monthly you go into it in-depth.

Respondent: Ja.

Interviewer: Okay, so that's fine.

Interviewer: Management system.

Respondent: Because then it would be the blind leading the blind.

Interviewer: How would you describe the process of managing new systems into an organisation?

Respondent: So, like I said, you know, previously it was always where, you know, you burned yourself because you never considered the change, then you considered the change and you build this and I'm finding more and more where organisations are going with their systems, I mean, it's like, you know, the adoption is.

Interviewer: It's adoption.

Respondent: Ja, and you know, organisations I think, who haven't got that yet, are going to miss.

Interviewer: There's going to be pain. What would you say?

Respondent: You take this phone, right, I mean you've got this phone, this is an Apple iPhone right. It's a standard device. There's not, you know, you actually don't have much choice in terms of customising this right, it's a standard device, standard iOS. You may, the only customisation you have is what you want. You may load your Twitter app, or whatever and stuff like that. An update happens at a central point, it gets passed on the phone, you don't even know right, you continue using your device. Now this is where our physical management systems need to go to as well. Where we then must adopt, I mean these guys have changed the world right.

0:26

Interviewer: True.

Respondent: I mean, what can you do? You can't do much right, but without it you can't survive.

Interviewer: Ja. Like you've got your leave application for example.

Respondent: My leave, my approvals that I have, that's the customisation but it's an app right. But everything else is pretty standard on this device right. I don't run an update, it gets done automatically, you wake up in the morning, you know.

Interviewer: What would you say are the, firstly the benefits of integrating management systems?

Respondent: You know so, benefits is always you having a single view of what's going on in your business right. A single or holistic view. Because otherwise you have multiple versions of this, because when data is pulled out the one system and pulled out of another system and then you have this integrated system, you never have the right view. You know, I use the example of obviously also a simple thing like granularity of data right. So, when you say, you know, this system has a closed date of that and the account executive is not here on that date. So, these things need to, that's another benefit of integrating right, because when you want to ultimately drill into your data, your systems granularity should tie I mean, you want to look at hourly but I mean, no-one wants to look at hourly things, but it depends what industry you're in obviously. You know, so these are some of the benefits. Like ease of access to data, you know, drilling down, you talk about horizontal/vertical, so the ability to look at your information horizontally, vertically, however it is. Those are benefits for me of integrating systems. Otherwise you never have that ability to slice and dice your information. You know, predict behaviour as well or predict your business as well you know, this gives you the ability to.

07:25

Interviewer: Predict what's going to happen.

Respondent: Predict what's going to happen yes.

Interviewer: From what happened previously.

Respondent: Based on the last five years, this is what's happened. This guy, I mean, a simple example, this guy constantly never gets the closed date right, so when I'm sitting on a board call, and I'm calling a mega deal and this guy, if I look in his history and I see that you know, he's never closed on the date that he said he was going to close and the guys tell me, you know, we're getting to commercial close, say for example 16th December, ja I think 16th December, and you have this date closing on 15th and the accountant needs to come in before the commercial close, and there, you're able to then say, you know what, no.

Interviewer: Not possible.

Respondent: Not possible, you know. That's a simple example right, but.

Interviewer: No, it's an effective one because it gives you historical data and how you can predict what's going to happen.

Respondent: In the future, ja.

Interviewer: Now, we've had a look at the benefits, what are the challenges?

Respondent: Of what?

Interviewer: Integrating management systems.

Respondent: Challenges. So, challenges are you know, like I said, and that I have to take you to the past because now we have integrated. So, when things are, so, the challenges is you know, if I look at my previous role, it's, we look at this type of thing, like these systems that exist where the level of granularity is not the same right. Then you may have some protocol to talk to one system that may not work with another system etc, etc. So, those, when you have to integrate, I mean I suppose those are the challenges that you can get to, but I never found, you know and then, in any organisation when you look at integration, everyone wants to be master of his own.

So, finance people don't want to share information with these guys, and HR don't want to share information, so.

05:27

Interviewer: People are in silos.

Respondent: Ja. So, you know, if the silos always exist then that's where the leadership has to take a strong role, to say you know, if you do not push something like this from the top, unfortunately you're going nowhere. Because someone has to instruct that finance team.

Interviewer: To act. You also mentioned something about change management?

Respondent: Ja. So, that's with people right. You know, when you want to introduce a standardised system, typically some guy says, this is how I work, because I've worked like this for the last twenty years. He doesn't know why, or she doesn't know why, but that's how they work. And then you bring in a new system that has new processes. These people don't want to move away from what they used to do right. They say, no, no, but my old system used to do this thing. Then you ask why, they don't know why, but they still want it the same. So, you know this is why you've got to bring change agents in. You've got to, I mean that's not my job, I can't, I don't think I have the patience to talk to my staff about why they have to.

Interviewer: To change.

Respondent: Ja, so, we let the change agents do it, you know.

Interviewer: What about skill training?

Respondent: So, I mean, we do a lot of that right. So, I mean if you look at, just not related to management systems, I mean, there's a lot of skills and training that happens in the organisation. But if there's something particular or specific within this change of rolling out, or when we were rolling out, is so we look at the complexity of it right, depending on how this thing's going to be so, okay, this one here let's send out a video. A tutorial, like that. And for that one there, they actually need the classroom.

03:52

Interviewer: Physical.

Respondent: Physical classroom ja.

Interviewer: Face-to-face.

Respondent: And this one we'll do e-learning, or whatever it may be.

Interviewer: So, the platforms are there. But depending on the complexity of the system.

Respondent: The system, ja. So, now how you create of a video, or e-learning, or whatever. And we make some of those, where we believe that it's fundamental to you doing your job, and because you've got to use the system, is we make it mandatory as part of your performance.

Interviewer: Performance agreement.

Respondent: Yes.

Interviewer: Okay. Or your KPI's.

Respondent: KP, well, when you get your bonus, you say okay, you didn't complete, this is your mandatory training you didn't complete, these are your optional.

Interviewer: Okay. Just wrapping up now. What are the factors in your view, that I should address that I have not addressed with you currently? That I should be with future candidates?

Respondent: What, for, when you talk about management systems?

Interviewer: Yes, integration of management systems. That I have not addressed.

Respondent: So, I don't know what you haven't addressed during this talk.

Interviewer: So, we spoke about skill training, HRM, Success Factors, financial. Risk?

Respondent: Yep. Yeah, I think so, risk.

Interviewer: Okay. Risk factors of implementing.

Respondent: Risk factors of implementing. I think some of the things you must also look at is, you know, one thing I would like to know is, how many of them do this because of some governance or compliance act.

02:08

Interviewer: Only.

Respondent: Yes. Like, you know, did you do this because you saw the benefit for your organisation, or were you forced by the fact that some King III or IFRS or this came along and stuff like that and you, you know, had to do it. It would be nice to understand what the results of that are. How many of them were actually forced into integrated.

Interviewer: Integrated measures, ja. The why, the how. Just on the last part, the doctoral study involves both a qualitative and quantitative part, so the qualitative part is my face-to-face interviewing right, the quantitative part is where there's a questionnaire that will have to go out and, would it be possible for me to actually send that questionnaire to you?

Respondent: Of course.

Interviewer: To disseminate to your colleagues or not, to your employees, so that I can have a response from them? It's not necessary you have to fill it in, but I think, how many people, you said that you have?

Respondent: Ja, we have about four hundred staff. So, I mean, I'll send it to, maybe together, a proper survey group, I'll send it to my direct reports and directly to the field. And then so ja, you know, cause otherwise it's not representative you know, if you have six of my managers or my leaders filling it out.

Interviewer: In fact, the sample would have to be at least a substantial number to generalise the study. But at the moment, I think if you have about four hundred people and if we get about maybe four fifty, four sixty, I think, no, three sixty, like that, it'll be fine. If I can humbly ask you to do that for me?

Respondent: Ja. When do you need that by?

Interviewer: Oh no, it's not really critical for now, I'm just completing the qualitative part. The quantitative part will come probably next February/March.

Respondent: That's fine. Because many people are on leave now, so that's a good time.

Interviewer: Okay.

Interview **12 and 13**

Occupation **Chief Information officers (regional)**

Sector **FMCG**

Interviewer: Good morning. Firstly, thank you for affording me the opportunity to interview and at offices, South Africa, in Bryanston. Firstly, maybe just before I start, just for the purposes of the interview, just introduce yourselves and your position.

Respondent 1: Thank you to be here. My name is and I'm responsible on ISIT in for a cluster, include Egypt, South Africa and Middle East.

Interviewer: Thank you.

Respondent 2: I'm and I'm regionally responsible for ISIT across Africa and India.

Interviewer: Thank you very much Pieter. So, just before we kick it out, I have a set of predetermined questions that has come out from literature and I would like to pose the same questions to you. So, the first question being, please provide a brief outline of management systems in your organisation.

Respondent 1: Okay. So, actually our work here in is SAP. Plus, is a, let's say it's a BackOffice covering all our operations and finance. Plus, for some particular cases, we have Protech, Solutions to cover HR, to cover route to market.

Interviewer: And marketing, sales? You have one.

Respondent 1: So, to market, ja. So, road to market for us is a terminology of sales. So, it's sales execution, let's say it this way., no, we are not really well advanced in marketing information systems and solutions. It's for sure, my answer is for Africa, it's not global.

Interviewer: Global, okay. Internationally, do you use SAP system as well? SAP as well. So, it's standardised?

Respondent 1: Yes.

Interviewer: Standardised, okay. How would you define a system?

Respondent 1: A system?

Interviewer: Yes. A system. Because normally, maybe I can give you an example, is a system, you have a body, right. A body, and with that system it controls all the different functions so that your body can talk, function efficiently. But in an operational part, or in a sense of an organisation, how would you define a system?

Respondent 1: It's more the same as your question. Before we go to a system, for IT, I suppose, the functions. Well, it should connect all the business pieces together. So, for me, system should connect the business pieces, it's sustainable, with providing efficiency for day-to-day operations.

Interviewer: Good. How would you define an integrated management system?

Respondent 1: So, integrated management system, I will back again to my point as well, because sometimes we draw up first, a dimension and we focus on silos, so that integrating is a system of boxes covering a different part of the business in order to smooth the day-to-day operations of our core business.

Interviewer: And a standardised system?

Respondent 1: It's a quite wide terminology, so.

Interviewer: Ja. Because normally you say that in an integrated system, you have the silos. And an integrated system is. A standardised system?

Respondent 1: So, can you repeat the original part of your point?

Interviewer: Okay, so a standardised system sometimes in an organisation, you can say that you have your procedures, locally and your local footprint is in South Africa. And if you go into Africa, it means that these processes, procedures, whatever you do in South

Africa, should be doing the same thing in Egypt, for example. So, it's standardised. So, how would you describe? Maybe I …

Respondent 1: Okay, so it's actually from ISIT point of view, it's much better to have the same platform, standard process across, which will make sure, will make you easier to support the process and system with less work, let's say it this way. But also, it's, we should take in consideration as well, the business uniqueness. Yes, for sure for some areas, it's much easier to have a standard, let's say HR, but for some other areas, let's say for sales, it's much better to take its uniqueness of the business type, the market, the local market, into consideration.

Respondent 2: Maybe just to add on, and I think that typically what we look at is a standard technology platform, standard processes where possible, but then looking at local specifics, but always looking at the internal control and the governance, of the overall organisation to make sure that we comply to laws, regulation etc, as part of a listed company etc also, but we handle it locally. So, even if you have specific execution of a specific process, we still use the technology governance.

Respondent 1: So, in order actually, it's first the preference to go for standard and second, how to make this a localised standard.

40:01

Interviewer: Localise it, ja. Describe how, if you have multiple systems in an organisation, like you say that you have SAP, and if a new system that has to come in, how would you actually, can I say, how would you make sure that a new system coming in works well with the system that you have already? How would you, how would that be undertaken?

Respondent 1: So, first question why do we need a new system, is the current system can cover the process properly.

Interviewer: Not, ja. The what, the now situation and then you're looking at the future.

Respondent 1: Ja. And actually, before we go to the new system, we need to think on the value-add, because sometimes, we dream, we think of a big complicated way. I think we're created this way. In reality, we do not utilise the full capabilities and features for the system. And, once we, together as a decision maker, but here it's not only ISIT, a decision maker should be with business colleagues as well, stakeholders. And once we finalise we need to have a new system, we need to understand the full footprint of the processes applicable to a new system and what is the impact of the current system, the full impact of the current system. Ja.

Interviewer: So, you do an impact analysis.

Respondent 1: Ja.

Interviewer: And how would you go about rolling out the new system?

Respondent 1: It will always have a committee, or actually, before we go out, to roll out, we have a project methodology in place, especially if it's a big implementation. Make sure for a big program we, in, actually I think it's something very good in, we try, or actually we push for all big programmes to be led by the business not by ISIT, because actually, we don't want to send the message it's ISIT projects.

Interviewer: ISIT?

Respondent 1: ISIT, information systems, information technology. Ja, so, it's the business, because every time, it's sometimes a mindset of implementing a big program. It's a technology, but actually it's an impact, social and business impact of a new system. It's much bigger than the technology. So, we have a committee, during the project we have a project methodology, we have a project committee and then we move to the normal rollout, it's, we start with pilot and then the mass.

37:06

Interviewer: Pilot first, okay. So, you have a project manager, a project team to actually rollout a new system?

Respondent 1: We don't have a dedicated project team, for big programs, we put a dedicated project team for this particular program. And then we release that team afterwards. So we don't have that dedicated project team for, but actually you can consider a business transformation.

Respondent 2: If you have no ISIT department for example, you will have a dedicated project manager, you will have dedicated people from the different functions in the organisation, sales, etc, ISIT, organisational development etc, which will be a structured team which will exist for the duration of the project. Most of them will be full-time, dedicated to the project. If you go for small/medium-type projects, it will probably be a mix, you will also have somebody that's accountable for leading the project, but not a dedicated project manager. It would be somebody that leads and keeps a finger on the pulse of the project. You have other people that spend a percentage of their time on the project, but they still do their normal day job as part of that. As the project goes off towards the end, they will just go back into business as usual. So, it really depends on the size of the project. I think one of the key elements that we always want, is to make sure that you have a clear sponsor, that clear decision committees and stuff like that. Blatantly honest with you, I will say, do the projects work better when you have them? Yes.

Respondent 1: Ja, but actually I've, at this point, I'm not biased for, I have been seeing other companies deploy out big programs, is, has a very strong methodology of implementing ISIT programs and more and more, we have seen stretch the timeline of the big programs so personally, I experienced TMIS implementation From Middle East in terms of SAP implementation. So, at, we named TMIS, and we ...

Interviewer: TMIS*?*

Respondent 1: TMIS, ja. So, is it z.m.i.s?

Interviewer: Management information system.

Respondent 2: There's always been very, very, very, lots of rumours about the interesting name, but it's the management information system. It's the name that it was called in 1999, so it stayed, how can I say, it was the terminology of the time.

Respondent 1: So, and we implemented for two business units, three business units, in five months. So, it's full implementation for sales units. So, it's quite a short time, and it was successful. And this is due to the dedication and the businesses also. So, in nature, if you need to have a successful implementation, you need to work completely integrated or else the future stakeholders does not consider your advice as a technology implementation answer.

33:56

Interviewer: Very important. The social part, that's for sure. I want to ask, you seem to have a good methodology in terms of implementation of a management system. Well, of a project. So, you say that there's a project sponsor, there's a project champion and you have people that are involved or integrated in the project, all the different partners, okay. Now I just want to clear that. But I'd like to ask a question here, how do you define a small project or a medium project or a large project? You know, is it by financial means? Or the economic impact to the company? Economic performance? Or are you looking at the impact in the market?

Respondent 1: It's not that easy to answer, so I will answer and Pieter can too, and I will not, I will try to be very transparent on the topic. So, as I mentioned, we are very successful on big programs. So, big programs, we are using waterfall methodology, which works very nice.

Interviewer: Sorry, just say that again.

Respondent 1: Waterfall project methodology, ja. And it works very nice, we've experienced many successes on that topic, but when it comes to small projects, we are struggling first to define what's different between small and, so it's not the small, small is very clear, but between medium and large programs.

Respondent 2: The question is how do you define whether it's large or small?

Respondent 1: Ja. And up to now, we don't have a clear, as far as I know, we don't have clear, criteria on the topic. Plus, it's, do we need to apply that same project methodology for medium/small projects, compared to the big project? I think it's a topic under discussion now.

Interviewer: Okay. So, it's something that needs, probably it will be the level of commitment of the organisational resources, because I would say that if you have an IT or an IS project that needs to be rolled out that costs maybe in the region of a hundred million, for example, then you will have the top level input where you would have at least once a month, someone from the organisation, like yourselves, would be there sharing this entire, to find out what is the progress, and whether this deadline is going to be there, or you're going to start shifting it or whether you need more resources, you need more finance, or you need more help.

Respondent 1: Ja. So, we have what's called IS committee. It's not a project committee, it's a collective committee between IS plus business stakeholders, mainly HR, finance, operations. And during this committee, we cover long-running projects, and status updates. And for, as well, we will not start any, even small projects, especially when it comes to integrated systems, without criteria, which is compliance, so we need to make sure we are compliant with the local regulations. It's top line generated, okay, so something will have top line. It's efficiency, ja. So, if it's not one of the three KPIs we'll not go ahead, whereas, despite it's big or small projects. Plus, we can, we will not go without the clear accountability platform from the other side of the business, so if we are doing something with commercial team, we need to have accountable sponsor on the project because of IS is the technical team, okay and between the two parties, they have regular meetings and regular updates, to decide, go or no-go and decide the project's status. And for management level, we are sharing on the IS committee. So IS committee is sharing update, focus update plus decision-making.

Interviewer: Yes. Alright, I can understand that. For this year, obviously the strategy of the company guides which project you want to go into, which area you actually want to fund more, and where is the gap, in order for the project to go through? And there's obviously monetary constraints, monetary, financial impact.

Respondent 2: Always.

Interviewer: And what is the cost-benefit analysis, obviously.

Respondent 1: So, mostly our focus this year is cost efficiency.

29:18

Interviewer: Cost efficiency?

Respondent 1: And this is common for all South Africa.

Interviewer: In your view, can you describe if at leadership level, leadership, because you'd have leadership, business and operations.

Respondent 1: So, leadership, you mean local leadership?

Interviewer: Ja, maybe let's leave it local, cause the study is local. Are your systems integrated? Or standardised?

Respondent 1: Can you repeat it, because I did not hear.

Interviewer: Okay, so, at leadership level.

Respondent 1: But what do you mean by leadership level?

Interviewer: There's three levels in the organisation, right. The first one is your leadership, right.

Respondent 1: So, the leadership, is the management?

Interviewer: Management's second and here is operational, right. These are three levels of.

Respondent 2: So, at the top level you're probably talking directors, then you're talking about the budget.

Interviewer: Yes. Exco, you're talking about exco, your c-suite. Here you're talking about the people that, at management level you're talking about planning, organising, leading, control of your general operations. And the operational level is where your systems are actually implemented, right. Because that's where it needs to work. So, at this level here, would you say that your systems are integrated or standardised? Do you guys integrate across this here, to say that whatever management information system that we have, you indicated earlier that these do not work in isolation, they must not be working as a silo, but they need to be integrated. So, at this level here, are your systems integrated or are they standardised?

Respondent 1: Okay, so before I answer your question, for me, silos is not good, silos is sometimes.

Interviewer: Okay.

Respondent 1: So, for leadership it's integrated, it's not silos. Ja, sometimes for management it's, you feel the silos and management informs that leadership.

Interviewer: Okay. So, here, it's actually standard? Standardised at leadership?

Respondent 1: It's integrated.

Interviewer: Integrated, okay. Fantastic. And here, you say that because there can be some silos, it can be standardised?

Respondent 1: Ja.

Interviewer: Maybe I'll ask this question first. Do you have a policy on integration? Of management systems?

Respondent 1: What do you mean by policy?

Interviewer: Okay, you will have a quality policy, you would have a SHEQ policy, for example. You might have a risk policy. Do you have an information management systems policy to say that, if you are procuring a new management system, this is the process that you need to follow? So, in terms of rollout, or, from inception to …

Respondent 1: That can lead us. Yes.

Respondent 2: Policy or best practice sharing. It depends on what's behind it for you, because we do not have a policy.

Respondent 1: It's not written Pieter.

Respondent 2: Ja, but that's what because we've got guidelines, we've got best practices, we've got nothing written like we would have in a risk policy or a quality policy, which is written and signed off on.

25:54

Interviewer: Yes, that's the one. Like for a quality policy, or a SHEQ policy, you'd see that you'd have top management or top leadership commitment. We would have you guy's signature on that then, saying on the wall, you know what, we are committed to providing our customers with best service. Our objective in terms of our environmental performance will be zero emissions, for example, or, you know, it's.

Respondent 1: So, ja, I don't know, I have a different point of view. It's not written yes, but its, there is a process in place. So, in a global term, in the global team we have what's called a and the have operations, sorry, the main directors, who's the decision maker on the platform, the technology and ISIT solutions. Now it's, and then actually, we should not pick up something up of standard portfolios and if we need to pick up something out of a standard portfolio, we need to get the sign-off, the operators and the main directors, to make sure it's integrated, accepted, it's passed by policy.

Respondent 2: If we had a signed policy, we would not have all the conversations that we have. Us and the GM's and all the guys, because there's still space for discussion, whereas with a policy, there's a lot less space for discussion. And that's why, I agree with everything Mohammed says, but there's no sign-off. There's an agreement in principle.

Interviewer: Or guidelines, or a memorandum of understanding or ...

Respondent 2: Ja. But nothing written.

Interviewer: Normally you would have a SHEQ policy. When you walk into an operational facility, you'll see there, at the reception, this is our SHEQ policy. And you're not unusual, most of the organisations that I know, except for I think SAP and Oracle or some other company, they had a policy that, if they have a new management system coming in, this is the process, so, but.

Respondent 1: We have a we don't have written something, but.

Interviewer: Okay. If you have guidelines, it's different. If you have a procedure, it's different. Just remember, guidelines, procedure, standard operating practice, best practices, these are the things that actually distil from a policy.

Respondent 1: Ja.

Interviewer: When you have, okay, you have a management system, what is the role of leadership and management in these systems? What is the role?

Respondent 1: I'm thinking.

Interviewer: What is the role of you guys and management as well, in terms of these systems?

Respondent 1: It's not that easy to answer because it's sometimes it's personal, so it's case-by-case. So, in some management team, we find people more into ISIT systems as a way to empower the organisation by ISIT. Then the role is very positive. And for some others, especially for older generations, I don't know if it's the right word or not, is, often times they don't consider ISIT as, can empower the organisation. So, it's case-by-case.

Interviewer: Okay, obviously he's talking about that certain areas and, because you would assume that at leadership level, an information system is an empowerment tool, because it's for you to make a decision. You have a look at the trend analysis, you say okay, for the past three months, this is how we are performing, so we can anticipate for the next month, this is what we're going to do. So, if you tell me that if it's empowering you, then it's a positive, but if you are telling me that it is, in certain areas, it's not being utilised to its full potential, then that is a challenge.

Respondent 1: So, for me it's if, you've seen the transition of ISIT as we started from a very functional focus, and then we facilitated a move, to be facilitators first time issues, and now we are more, I'd say we are less of technology, and more core of the strategy in some areas, so if you see the whole new business, successful new business model, it completely depends on full ISIT. So, when it comes to the leadership, some people still live on functional level of ISIT, and they often do not consider ISIT more on a functional focus. It's a technology.

Interviewer: That you can use and enable and move the business forward.

Respondent 1: It's not, some of them does not see the ISIT able to move business forward.

Interviewer: Okay, so that comes to the next question. Why do you find that these are the challenges? What are the challenges? And that's probably leading to this question or the answer that you've just given me now, is that people are not seeing the benefit of an integrated management system. Or of a management system to move them. Why is this a challenge?

Respondent 1: Okay, it's a internal reason. We don't promote the technology as a business enabler and then ISIT experts. Most of the time we are more focused still on the function, how to make sure the transformation is already done. We are as a resource, is focused on function. And at the moment, we try to promote ISIT as a business enabler. We don't have the right moment to anticipate our business requirements, so we are working reactive, not proactive. So, because if you need to be a businessman, you know you need to get information at the right level, at the right time.

19:39

Interviewer: Real time.

Respondent 1: Real time. Or right time. If you are not able to get it at the right time, it means we will not provide right solutions and the greater solution.

Respondent 2: I think we're a little more, generally I agree with that, it's a little more challenging. I believe even if and when we get the information at the right time, we're still not successful to articulate because I think we are still struggling as a function to articulate what we do in terms of the business KPI's. And business leaders from other functions also do not fully understand always, because our articulation is not good, how our systems and solutions we bring can drive their KPI's and targets that they drive, so there's a bit of a disconnect, we're not speaking the same language, and you still do not have enough people in the function that we operate in, that are able to articulate in real business language, what the value is, of what we do. We are very good at saying, we can make things faster.

Interviewer: Efficient, ja.

Respondent 2: We can make it more robust, and more agile, but very few people are able to articulate how does it drive the top-line, how does it drive profitability, how does it drive the cash flow.

Interviewer: Efficiency.

Respondent 2: And above that, how does it drive the perception to the outside world. So, there's still not enough leaders in our space.

Respondent 1: But if a transition should happen again, from transitional also a functional focus, to be more business enabler, however the transformation happens, we did not develop our team to drive this transformation, plus still we are, in the other side, its stakeholders still have not recognised the transformation. So, it's two, it's mutual.

Interviewer: Yes. Mutual agreement. But it's very, very interesting that, it seems, from this, what my perception is, it seems that the leadership have a certain area that they want to go in or a certain direction and it can be that, at the bottom here, there is a disconnect between the leadership and the management and the operational side. But obviously there's change management that comes in, organisational development that actually has an impact. Because somebody should be able to show the employees, the milk and the honey. There's somebody that's in charge of that. And that comes from.

Respondent 1: But I think some of it will come very, very soon. If you see the new generations whose joining, to be co-workers, they are coming with completely different mindsets. It's technology for them, it's given, it's not something add-on, and they want to facilitate the technology, even on their personal life. So, they are expecting more to be, to find on workplace.

16:42

Interviewer: You know I've been to one of the companies and they told me that in an HR space, if you interview a guy, and you make the decision that you want to employ him, within the next twenty-four hours, the guy can have his contract in his inbox. That's the efficiency they have. Because there's no, you know the red tape? It just goes through efficiently. Just by the use of the mobile. Very efficient. So, the agility of that management system really works well. So, we said that in the challenge of the integrated management system is obviously, the social part, the people, because if you don't want to accept this new change, then it's going to be always a stumbling block to move forward. What else? What else is a challenge for you guys in terms of …

Respondent 1: I think the technology, the fast move of technology, it's more and more, we move to cloud and that, your infrastructure as a service, so now it's more a move to more service, and again, with more and more we are facing a new generation's co-workers, which for them, it's easy to go and get something off-shelf, that's not fully integrated always for the system. And the more you are, you're having less control on your co-workers.

Respondent 2: Because there's no policy.

Interviewer: Yes.

Respondent 1: There's no policy, is one part and the other part, Pieter, it's again, for us, we are more thinking on, we are thinking of the integrated way. So, before we have the cloud, we need to make sure we have our cyber security, we are and for someone from outside, it's just, I need to make it, I need to do it. So, more and more we are faced you know, with discussion, working in team, and by the way, we developed a nice app for HR, we developed a nice app, where, without ISIT info, you don't need to have ISIT.

Respondent 2: The services are certainly more readily available.

Respondent 1: Especially on the top line.

Interviewer: But that's a disconnect there, hey Mohammed. That's a disconnect in the organisation. As you said, you know, about the silos, if somebody's developing an app without the information or the IT department, there is so many policies that needs to be, or guidelines, or operating procedures that need to be followed first, before this. Because you're talking about an integrated management system. If you're talking about an integrated management system, if you have a system and all of these things are actually filtering in, there are certain guidelines, a framework that must be satisfied in order for these things to come through. Because you can be hacked, for example. How do you handle it?

Respondent 1: So, my boss is not here. Let me give you a very small personal story, experience. My son is, now he's nine years old and one year ago, in the morning I had a discussion with, I have my wife's phone in my hand and she has many pictures, and I thought, why do you have that many pictures, you can consolidate, you can create a group and put similar in one group. She asked me, can you do it? I said no, I know Apple does, so for sure Samsung won't do it. Let's Google it. My son next to me, he talks about, create an app for her, drives the app through the phone. So, it was the first technology I think, with a new generation, fully-secured, fully closed technology, so the question of integrated systems, the terminology of integrated system, now it's mutual questioning, should we think on how we are thinking today with all the policies we have created up to now, how we need to think different to accommodate the technology fast-moving, to accommodate the new generations who will join us tomorrow. So, again, it's a question of how do we need to develop our team. There's, for something we don't know yet. But if I asked you three or four years ago, can you consider the taxi firm to be on your mobile and completely move into a new business, the answer, no. Okay, and now we have, so what will happen tomorrow? We don't know what will happen tomorrow and up till now, we are still targeted on how we think on developing our team. We think to develop our team for things we know today, and not for tomorrow, or the day after tomorrow, which we'll not know? Not for a new generation who'll join our business, say oh. Sometimes Pieter and the ISIT team, so, and they want to move fast. So, the question is, yes, we need to be balanced between policies but also, we need to foresee the very near future, what will happen and how ISIT needs to play the same role of integrating, but with some change.

Respondent 2: A good policy will accelerate integration, because then people know what the playing field is. At the moment, what we're facing, people do not know what the playing field is. They do whatever, and then we get what we always get, okay, the things are not connected, oh shit, now we need to talk to ISIT, now we're two years down the line, we've created a big monster this size, and now we need to connect this new monster with this monster and now we've got to run an integration program. If, at the start we said, okay, there's a policy to dictate and help to understand what the playing field is, how do we allow this to accelerate, but alongside that, how to connect it into our overall framework so we can maximise the underlying platform, that is where the answer would be. And that is where, we at the moment are totally, totally at risk, we do not have that.

Interviewer: And you know what, I must agree with you Pieter, because you find a lot of people that are working on Excel spreadsheets, they have their own Excel spreadsheet. Whereas, if you have a management system, for example, that would be able to give

not only you information, but it'll be able to give the organisation information. The Excel spreadsheet is just an example to show you that, you know, people are working in their own silos, whereas this information should actually be going into a management system. And if you are going to have the small, side-line operations, it's the policy that's going to drive to say you know what, this is not the way the organisation wants you to work. Leadership is telling you, then it means that it's a discipline issue. It means that you don't want to follow the route, or the culture of high performance. Culture, having a high-performance culture, it means that you are operating on your own and you don't want to divulge your information. But, that's only from what I understand. I've also seen this in other companies as well.

Respondent 2: The thing about a policy is, the way I see it, what happens is at least it creates a conversation upfront. And upfront you can decide okay, we're going to do it in the old way, or you know what, this thing actually, for whatever reason we decide, based on certain parameters, we can leave this one to be disconnected, because maybe it was just a learning opportunity by itself, which we're willing to scrap and rebuild, or whatever. But at least then the conversation happens at the start, where you're drawing the dots at the start, rather than drawing the dots at the end when it's a mess.

Respondent 1: But it's not a policy as a normal policy definition. It's how can we make a decision collectively.

Interviewer: Yes. Management.

Respondent 2: Just that could be your policy.

Respondent 1: Ja.

08:45

Interviewer: Okay, how do you determine the maturity of integration in your organisation? How do you, because I see there's some disconnect, but would you say that, because normally you have a level 1, level 2, level 3. Some companies have that, so they'll tell you that at level 1, at this level here, we have all our documents integrated so everybody understands. Level 2, is that management now understands how to use the integrated management system. Level 3, it's been audited across the three levels, to say that you know what, we had an eighty percent, and we should be at ninety five percent, for example. And then we have created a gap and with this gap here, we have identified, these are the key areas that need to be addressed. Who is going to do it and by when. So, do you have something like that?

Respondent 2: I think that's what we're trying to do a little bit with the way we've been working with the organisation for the last eighteen months, but we certainly can't claim that it's there.

Respondent 1: So, actually we have, well actually we don't have a written policy, just to make sure it's clear. We are moving or actually progressing good in some areas, especially in operations. So, on operations, we have the integrated conversation, because different stakeholders make sure we are applying the integrated system as much as we can. And for other parts, actually when it comes to consumers, especially consumers and top-line, no, we are far away.

Respondent 2: But one of the things that we do have an audit on, which is not specific systems, which is, which is total control procedures, which is audited all the way across the company in terms of whether the company applies to the procedures and the way of working. That globally dictates. That happens. It's very formalised.

Interviewer: So, there's an audit.

Respondent 2: There's an audit, but it's not focused specifically on systems or integrated systems or something. It's on company processes.

Interviewer: So, it's like a South African excellence model or you can talk about the Balrich model. It's an audit of the entire supply chain, both, if you have a look at the supply chain, inputs, outputs, the transformation process, and you have like marketing, sales, HR, finance, just to tell you how you are doing.

Respondent 2: No, this one, this would be, it would take for example, the purchase order process or it would take the planning process or something as a transversal process across the company, and will make sure that all the elements is done in the right way and that we control the quality of information security etc, across that type of process.

Interviewer: And risk is also included in that?

Respondent 2: also has risk audits but is not risk audited every year. I don't know how the rest of that stuff works. Do they still have it?

But that is a separate, there is also a risk mapping input. It's internal self-audited, all of that, and then every number of years, there's a, let's call it an external audit by KPMG, or something, who take a look at the audits that we did.

Respondent 1: But actually, promotes for integration, not forced integration. So, it's tied up with purchase process. We need to have a system to manage your supplier profiles, but the system should be fully integrated with other systems. So, it's promote but not force. It's promote for integration, because for sure it's by default, if you need to manage your supplier, you need the same system to manage your orders.

Interviewer: I'm almost there now. What do you find are the benefits of integration?

Respondent 1: It's a default answer, efficiency. So, if you have integration, then you'll have efficiency, for sure. This is one. Second is integration also, it's the social power of the integration so, it means that integration. I believe, that you need to build up a kind of one culture for your organisation, you need to make sure that.

Interviewer: Would you say agility?

Respondent 2: Definitely agility. And function and depending on what level you look at it, at integration, the benefit of integration is that you have quality of the data, you have better decision-making, you have etc, so. It's probably agility and stuff.

Interviewer: So, data integrity.

Respondent 2: Data integrity. I think a big positive, if you have a true integrated system, integrated process and people integrating across that, you will have a different culture in the organisation, which is a much more collaborative, much more, we are working towards, working towards the same goal without insiders.

Interviewer: Communication?

Respondent 2: Definitely an advantage.

Interviewer: Last question. What are, in your view, the factors that I should consider for the study, that I have not discussed with you guys now?

Respondent 2: Great that question. There's always a question I ask for other people

Respondent 1: So, for me, people. You need to consider people.

Interviewer: You mentioned culture. So, with people, what would you like to, because we've already discussed the culture?

Respondent 1: So, your study is focused on systems. So, we need too to think about the people that's doing the systems.

Interviewer: So, from an employee point, because we've addressed the management part? It was addressed, the leadership part.

Respondent 1: From a technical team aspect.

Interviewer: Technical, oh yes. Okay, technical team.

Respondent 1: So, I don't see any part about the technical team, which it's, technical team, why I say is, technical team plays a key role of promoting these integrated systems.

Interviewer: Okay, so when you say technical team, so what type of.

Respondent 1: I mean the ISIT team.

Interviewer: Okay.

Respondent 1: So, how can, how do we need to balance this team, to make sure you are delivering these integrated systems? What is the role of this team? It's easier to make it integrated or silos?

Interviewer: The skill sets?

Respondent 1: Skill sets.

Interviewer: Knowledge?

Respondent 1: Ja.

Interviewer: Experience?

Respondent 2: I think it's a balance between the real hard tech skills but still understanding what the impact on the business is, because we've got very good people that are very close to the business process, but they're not technically that strong. We have some people which are super technical, but they have no idea what business is about. They still think it's about IT. It's to find that balance. Because you need these guys. You need these guys, but how do you get some others in the middle that can help also bridge that gap. And I don't think the balance today is quite right yet.

Respondent 1: Also, I believe somewhere we discussed decision-making? But I think you need to give it more focus on how integrated decision-making should be. To force us to more promote I think integrated system.

Interviewer: Integrated management system? Ja, okay. I think I've already addressed that, you're right. So, that brings it to the end. I really appreciate your time and the input. It has been invaluable. It's really nice to have two experts in the field to have input in that. Thank you once again.

Interview **14**

Sector **FMCG**

Occupation **Country Quality Manager**

Interviewer: Morning Vimlan. Firstly, thank you for your time, I really appreciate it, you're a very busy guy, to afford me the opportunity to interview you. I really, really appreciate it. Vimlan, just to kick it off, can you please just give me a brief background on yourself and the organisation and how long you're employed.

Respondent: So, from a background point of view, I think I've got both experience and academic kind of qualifications supporting the area of quality so, in experience, I've been working in this organisation for twenty-nine years.

Interviewer: … organisation

Respondent: Ja, which is now not South African, but it's. So, we've just been taken over last year. But ja so, the quality areaactually, my experience has been for the whole period that I've been in employment, although the last three years, I've not managed quality directly, I was in general management. Quality was one area that formed part of general management. Okay so, previous to that, I've been in, worked in laboratories, worked as quality manager, managing laboratories, managing quality systems. Quality assurance functions at a plant level and also at a country level, and also for at a global level.

Interviewer: So, essentially you have, from operations to business unit to a strategic level?

Respondent: Ja. Strategic level, it depends how you define strategic level. At a plant, also you have operations and you have strategic management, so your level four in the plant is strategic so being at that level and then moving into a country level, it was purely strategy. And global level was purely strategy.

Interviewer: Fantastic. So, let's just go through the structured questionnaire. Can you just provide a brief overview of your view on a system?

Respondent: A system, meaning any system or quality management system?

Interviewer: Ok, let's be first, let's go on a general system, as you understand a system. So, a system can be a, you have for example, a nervous system, you'll have an endocrine system. And those are all systems that make up the body so, what is your, what would your view be of a system?

Respondent: Ja, I suppose the simplistic view is a system comprises of many parts and a system is generally defined as being greater than the sum of the individual parts, so the outcome that you get of the system is definitely a much greater output than the individual parts that make up the system.

Interviewer: And integrated system?

Respondent: A integrated system really builds on it as far as saying, it looks more around the interrelationships between the various systems and it looks at the common areas that one sub-system has with the other. But, at the same time, each sub-system has got its own unique output.

Interviewer: And a standardised system?

Respondent: A standardised system, I suppose comes from the definition of the word standard. So, it is a system that is defined by predefined standards that can be kind of either local or international. So, local it's defined internally and a standardised system could be local to an organisation. Like, for example, if you look at our organisation in the, you'd have many technical standards and systems which has got some alignment, you could say, and will be aligned to some recognised standard externally, but sometimes very specific to the operations internally. And then the external system is generally based on a recognised standard that has been agreed by a code of practice, by a community, whether it is the International Standards Organisation or whether it is a local standards organisation. And that's where the ISO systems etcetera actually ...

Interviewer: Combined system?

Respondent: Combined. If you are looking at again, from a management system point of view etcetera, it's actually saying it's similar to the first definition of sub-systems. So, it's two sub-systems and then an example of it would be, you could have an environment system, environment management system and a quality management system. Or a quality management system and a food safety system. But, they would actually have certain principles that are common and certain principles or standards or elements that are unique, so you can combine a quality management and food safety standard system together and previously, if we look at what the International Standard Organisation has done, itessentially, has taken the ISO 9000 series systems in the food safety environment, and combined it with the HACCPsystem. And if you look at the ISO 21000 today, there's a combination of the 9000 and the HACCP system.

Interviewer: HACCP?

Respondent: Ja, H.A.C.C.P. the risks.

Interviewer: Critical Control one.

Respondent: Ja. HACCPis analysis and critical control focus.

Interviewer: Okay, fantastic, thank you. Just the last one on the definitions, a management system?

Respondent: Management systems to me is really kind of saying it is more around, again, and you can use the ISO systems for example, the HACCP system, the environment system again, but it's really the system that provides you with very clear guidelines on principles in terms of various elements that you require to manage an organisation. Which includes, how do you organise? How do you actually appoint management responsibility? How do you conduct collective preventative action? How do you do document control, record-keeping etcetera, etcetera? So, that's, I'm giving you details on each elements within a management system.

Interviewer: Management system. So, essentially, you can be talking about a quality management system, an environmental management system?

Respondent: Any management

Interviewer: Ja. So, would you say that a financial management system exist or?

Respondent: Ja. Again, I suppose the point is it's like what we, I was talking about HACCP so it's about control points. So, it's around identifying risk, and looking at ways in terms of, how do you mitigate or manage risk, and then actually putting controls in place to either mitigate or manage them. And at the same time, it can also be viewed as a system that provides you the health of the operation. So, it could actually give you a view in terms of how well you're doing against the target, or how badly you're doing against the target.

27:09

Interviewer: A dashboard.

Respondent: Ja. It could be a …

Interviewer: KPI.

Respondent: a dashboard and KPI,actually that element is really kind of giving you the reporting.

Interviewer: Feedback.

Respondent: Ja, it's, I suppose the best way of describing it would be the feedback mechanism. You could use KPIs, you could use dashboards, you could use different types of dashboards, which are simple as far as kind of giving you coloured indicators, red being kind of out of control, orange being kind of, it needs monitoring and green being okay.

Interviewer: So, it is a management tool as well. For reporting.

Respondent: The, well, the purpose of it is really to provide a management report.

Interviewer: Discuss the type of management systems in your organisation. If you can, provide an example. So, here you could have like a SAP Management System, that's more of a control. You could have Oracle, or you could have a Sage-Pascal system for example. But I think …

Respondent: There's many …

Inerviewer there's quality …

Respondent: so, you can go from quality point of view, we've kind of covered things like the ISO systems. From a safety point of view, it will include the NOSA Safety Management System. Financial would be the Sarbanes-Oxleysystem.

Interviewer: Sarbanes-Oxley*?*

Respondent: Ja. But also, I think you know, you've got other systems, like for example, just simple laboratory measurement, you would have a module within the bigger operating system like SAP, so it would be called the quality module of SAP. Or procurement module of SAP. Or maintenance module of SAP. Financial module of SAP. So, all within, I suppose that's where you come to the whole integrated SAP. Having different modules for different management systems. And it also provides you the platform for operations. So, how do you actually operate? And how do you capture records of your operations? How do you evaluate the operations? And also, how do you order for purchasing and pay for purchases?

Interviewer: Describe how you would handle multiple systems in your organisation? How would you handle multiple systems?

Respondent: Generally, I think there is an underlying kind of strength, or platform that gives you, really the platform, if you want to call it as a word, to execute various functions. So, when you are actually looking at, or executing, or evaluating quality, you will work with the quality system, irrespective whichever function you are. When you are actually in the aspect of procurement, you look at the procurement system. When you're looking at safety, you will engage with the safety system. So, it depends on the duties or roles and responsibilities that you actually are undertaking. You use the various system that has been predefined by the organisation.

23:31

Interviewer: So, in your case, it would probably be SAP? So, that's the platform that you're talking about?

Respondent: We use SAP for most. For planning, we may be using something else, which is more, not necessarily an off-the-shelf, but a more user-defined system, which we call IMARA, I.M.A.R.A., IMARA Operating System.

Interviewer: So, this is in-house?

Respondent: In-house developed, but it actually interfaces with SAP and interfaces with the JD planning, distribution systems etcetera.

Interviewer: So, you have SAP. JDE and IMARA?

Respondent: Ja.

Interviewer: Those are the primary management systems you have?

Respondent: Operational systems.

Interviewer: Operational systems.

Respondent: Ja. Management systems really for us is kind of what we use as part of governance. So, governance wise, those, the governance systems are mainly there as I described, the quality environment, safety, operations governance, is built into that and then you'll get, you'll have an internal audit team that actually has a company policy methodology of auditing operations, and that gives management really kind of a health-check in terms of how well you're doing, or not. And then to support that, you would have an external audit committee, and we use PWC to do an external audit, to tell if the internal audit system is checking the right controls.

Interviewer: So, it's a good tool, or it's a good, how can I say, it's a good part of the organisation, having operations governance. I haven't come across this yet. But it's just a health-check in terms of how the organisation is?

Respondent: Ja, so, it does not only operations but also financials. Financial and operational kind of health-checks are done by internal and external audits. And there is a review and feedback from a management point of view identifying business risks and we go by first identifying the top ten risks, and then all the other control checks that have been signed off, have been okayed or violated and the ones that have been violated, it will be raised as a finding which you need to put in a mitigation or corrective action to close, and a period of time is given, how quickly you must close and that feedback, that review happens at the executive level at plant, at director level and board level at the centre.

Interviewer: Thank you for that. Once you have a new system that is going to be required by the organisation, what happens next?

Respondent: So, normally the way we actually undertake it is, firstly the system in terms of the reason why we need the system is established, and once that's established, a project team would be put together to actually define how we actually, not roll-out immediately, but actually, I suppose the way is, deploy is a better word than roll-out. Deploy the system into the business. And that will include the project teamwe have having to create the regional teams that will be required either to scope and define requirements for the business and, when that is done, how do we actually testthat the system works and once the system is tested …

Interviewer: Piloted?

Respondent: ja, I suppose pilot is a word, but actually, I suppose, test in terms of functionality. And it could be multiple plants, therefore not necessarily every time pilot, if it is agreed. And when you start, when you do that and you believe the system actually works, then you would actually implement it into the business with consolidation and providing awareness for the organisation. And the awareness initially, at an awareness level, but as soon as the implementation phase starts, it will be much more closer and into, in terms of training and implementation. And then once it's implemented and trained and the system is used, and then the system is audited to see if the system works, and the audit would continue at least for a defined period of time to see that the system is fully integrated into the existing systems or we will replace an existing system and in case of, a new system actually will replace an existing system, both systems may run for a short period of time, but otherwise, if it is brand new and there is no other system, it will be implemented and tested like that, but if it is running in conjunction with something else, once the credibility has been built on this system, the other system will be switched off. So, this system will be, it will be the 'go-live' system. So, there will be a 'go-live' kind of fix.

15:59

Interviewer: Good. Okay. You mentioned something about, that a system has to be integrated into the organisation. What is your view on integration? What is your view, on integration?

Respondent: Well, the simplistic view is, you cannot do anything in an organisation in isolation. And therefore, everything that happens in an organisation has to be part of the process.

Interviewer: Are you talking about transparency?

Respondent: Well, transparency is kind of a given, I'm talking more around, you get an organisation as big as the, you cannot have something that actually exist as a standalone. We don't operate standalone systems. Everything that we actually operate, is part of a bigger system, delivering a specific KPI, or delivering multiple KPIs. But the source data and the source information in our case, is generally on multi-platforms, so you know, nothing actually happens on a single platform. Although, you could actually say that we actually operate in the centre, as a central organisation. The centre, for example, produces nothing, so all the information and what the centre needs to work on, is information that actually is coming out from either the operating plants, distribution, sales, or, they are actually involved in putting in strategies and plans that the plants need, to operate.

Interviewer: So, what is your view on integration? Is it, so maybe I just need to be a littlemore clear here. Would you say that at an operational, distribution and sales level, at regional level, you guys are integrating or combining? And at which level do you think it's happening? It's combining at HQ and you're integrating at regional level?

Respondent: I think, as, we operate the organisation as a complete single entity, so you will have different parts to it, so you could actually say there is a below-the-line operations, which kind of is really, how do you actually get from raw material to finished product. And product right to the hands of the consumer. To above-the-line product, above-the-line kind of operations in terms of saying, how do you create the mechanisms and platform for that execution to happen? And actually, finally, kind of translating into sales. And then once you do that, how do you actually create strategies for example, in terms of profitability, revenue management, pricing, planning, operations, so that operations know what we do. All of those planning and so forth, happens at a central level, but it happens for plants. So, everything around it even as far as planning a truck, in a way, although it is kind of site-specific, but the bigger plan in terms of what the site needs to actually plan, actually comes from the head office …

Interviewer: So what is your view on integration or standardisation in combination? Where do you think it all happens? Or do you think that your organisation is fully integrated?

Respondent: Ja, so that's why I was saying that the organisation can have different pieces to it, so you could have kind of a production piece, you can have a distribution piece, you can have, or production warehouse and distribution sales and all those pieces actually operate as one entity, so one cannot operate without the other, so therefore if there's no production, there's no sales. If there's no sales, there's no need for production, soitis always a continuous kind of communication from both sides, on both ends. And then over and above that, you get further communication and support and interaction from the head office. So, the organisation cannot operate any other way besides being as an integrated unit, so even if you sell a product in Cape Town, it has to be connected to the sales plan and also even, as far as it could be production plan in Johannesburg, because some products and some kind of offerings, which we call SKU's, stock keeping units, are not manufactured in every plant. And it's actually produced mainly here in Krugersdorp, or for example, Miller Genuine Draft, we only produce it in one brewery, in Alberton. But we distribute it to the rest of South Africa.

09:19

Interviewer: So, just to close up on this, in your view, at leadership level, at HQ, are management systems integrated or combined?

Respondent: Again, I'm not sure what you mean by combined, because there's different functions, ja, there's different disciplines. So, you've got a financial function, you've got a supply function, you've got a distribution function and so forth, but at head office, the measure of the business is the profitability.

Interviewer: Yes. So, you're taking all these other reporting systems and putting it together and then making a decision.

Respondent: Ja.

Interviewer: So, as you said that you're using, from the warehouse, from the raw materials, goes to the warehouse, goes to production, then it goes to distribution and to sales. And you take all of this information which you've indicated, you've integrated all of that to get one financial, or to get one report. So, would you say that at HQ that you are combining this, all these reports from the different regions to make a decision? Or are you integrating it. Because you said that the integration is taking all the different systems and parts and putting it together that's what …

Respondent: Ja. I would say, and that's why I'm actually battling with the word combine. Integrated to me is everything actually, the workflows of everything is actually connected to some cord and all of that ends up somewhere.

Interviewer: That's what I understand as well. So, that's fine. At this point, Vimlan, I want to ask you, does your company have a policy on integration?

Respondent: I don't think integration actually is seen as something that is separated by the policy, it is actually, in this organisation it's seen as the way you do work. So, that's the model that it's built on. So, that's been our policy here.

Interviewer: What would the role of senior management and leadership, regarding management of system, what would their role be?

Respondent: Well, it can be kind of perceived as one, they are the enablers, because they are the ultimate decision makers in terms of actually enabling what systems we use. But also, it can be seen as, they are the users. So, also interface with the system, but at a different level. So, the system for them provides the information …

Interviewer: Information?

Respondent: the kind of plants and operations really use the systems to, if you want to call it, more on the basis of populating data and they do convert data into information, but maybe at a lower level. But at the head office level, it is really taking the data that has been populated and transforming that data to information and knowledge, so that the business can actually operate. And make decisions.

Interviewer: You mentioned an important point here, it's an enabler, and it's, that the users actually input this information that allows strategic role players to make informed decisions. Is that?

Respondent: Ja, it is. Because that's where the data becomes information and knowledge and it actually looks at how you react to internal and external environment.

04:26

Interviewer: What would you say are some of the challenges facing integration of management systems within an organisation?

Respondent: Challenges?

Interviewer: Maybe I can say, okay, maybe when you have a new management system that you need to roll out, and you said there's a few things that needs to happen there. You said that there's skills involved, there's training involved, there's obviously some change management that occurs.

Respondent: So, the challenges based on that could be very much in terms of the systems being inadequate to actually deliver the envisaged outputs. So, you may have bought a system or you may have actually agreed on a system to actually provide you certain information and knowledge again, but it actually doesn't give you that information and knowledge in the same format or the way you want it. And normally, people tend to, from a cultural point of view, fall back into bad habits and not actually want to embrace change to the system. So, you know, you always have the change management aspect. System failures and your system failures could be and you know, for any system that we implement, the mortality rate is much higher at the beginning. If we had to take the bathtub kind of analogy, it's very high until it stabilises, until you fine-tune it, until you get it to do what you want. And that time can actually be quite consuming and very disruptive and can provide inaccurate information.

Interviewer: Is there any risk involved? Because imagine some key …

Respondent: There's always risk.

Interviewer: But you said that there's risk governance in managing projects, because you have a project and the project goes through certain timelines or milestones to make sure it's actually not disruptive. So, what do you think are the benefits of integrating management systems?

Respondent: I suppose it comes back to the whole thing around the definition of a system. A integrated management system is actually saying that you've got a very clear view and definition of what the system should be delivering, or should look like, and the integrated management systems is saying that each management system is a sub-system and comes back to the point of, if that is the way it operates, the whole is always greater than the sum of the individual sub-systems. So, having the sub-systems operating individually, is much more cumbersome than having all the sub-systems actually talking to each other to provide the whole.

Interviewer: Okay. Would you be able to provide a level of maturity of integration in your organisation? Say level 1, level 2, level 3, do you have something like that? I'm not going to be long, just going to check my emails and then do some …